Federal Motor Vehicle Safety Standards and Regulations

Supplement 42—Amendments and Interpretations Issued During 1990

Page Control Chart

(1) PART 531—Passenger Automobile Average Fuel Economy Standards

(a) Insert attached pages numbered PART 531; PRE 179 through PART 531; PRE 184 behind page in book numbered PART 531; PRE 178.

(b) Substitute attached page numbered PART 531-1 for similarly numbered page in book.

(2) PART 538—Minimum Driving Range for Dual Energy and Natural Gas Dual Energy Passenger Cars

Insert attached pages of new PART 538 numbered PART 538; PRE 1 through PART 538-8 behind page in book numbered PART 537—7-8.

(3) PART 544—Motor Vehicle Theft Prevention; Reporting Requirements

(a) Insert attached pages numbered PART 544; PRE 35 through PART 544; PRE 38 behind page in book numbered PART 544; PRE 34.

(b) Substitute attached pages numbered PART 544-1 through PART 544-C-1 for similarly numbered pages in book.

(4) Federal Motor Vehicle Safety Standard No. 110

(a) Insert attached page numbered PART 571; S110—PRE 9 through PART 571; S110—PRE 28 behind page in book numbered PART 571; S110—PRE 8.

(b) Substitute attached Standard 110 for Standard 110 in book.

(Continued on reverse side)

(5) Federal Motor Vehicle Safety Standard No. 114

(a) Insert attached page numbered PART 571; S114—PRE 21 through PART 571; S114—PRE 30 behind page in book numbered PART 571; S114—PRE 20.

(b) Substitute attached page numbered PART 114-1 for similarly numbered page in book.

(6) Federal Motor Vehicle Safety Standard No. 213

(a) Insert attached pages numbered PART 571; S213—PRE 67 through PART 571; S213—PRE 71-72 behind page in book numbered PART 571; S213—PRE 65-66.

(b) Substitute attached pages numbered PART 571; S213-11 through PART 571; S213-15 for similarly numbered pages in book.

(7) PART 572—Anthropomorphic Test Dummies

(a) Insert attached pages numbered PART 572;PRE 83 through PART 572; PRE 87-88 behind page in book numbered PART 572—PRE 82.

(b) Substitute attached pages numbered PART 572-7 through PART 572-16 for similarly numbered pages in book.

(8) PART 574—Tire Identification and Record Keeping

(a) Insert attached pages numbered PART 571—PRE 47 through PART 574—PRE 63-64 behind page in book numbered PART 574—PRE 45-46.

(b) Substitute attached PART 574 for PART 574 in book.

(9) PART 591—Importation of Motor Vehicles and Equipment

(a) Insert attached pages numbered PART 591; —PRE 17 through PART 591; PRE 41-42 behind page in book numbered PART 591; PRE 15-16.

(b) Substitute attached PART 591 for PART 591 in book.

PREAMBLE TO AN AMENDMENT TO PART 531
Passenger Automobile Average Fuel Economy Standards
(Docket No. LVM 89-01; Notice 2)

ACTION: Final rule.

SUMMARY: This decision is issued in response to individual petitions filed by three low volume manufacturers, Officine Maserati S.p.A. (Maserati), Lamborghini of North America (Lamborghini), and LondonCoach Co., Inc. (LondonCoach). Each company requested that it be exempted from the generally applicable passenger automobile average fuel economy standards, and sought establishment of lower alternative standards for each model year (MY) from which it sought exemption. This notice grants exemptions and establishes alternative standards as follows:

Lamborghini petitioned to be exempted for MYs 1983 and 1984. This notice grants that exemption and establishes alternate standards for Lamborghini of 13.7 mpg for MYs 1983 and 1984.

LondonCoach petitioned to be exempted for MYs 1985 through 1987. This notice grants that exemption and establishes alternate standards for LondonCoach of 21.0 mpg for MYs 1985 through 1987.

Maserati petitioned to be exempted for MYs 1984 and 1985. This notice grants that exemption and establishes alternate standards for Maserati of 17.9 mpg for MY 1984 and 16.8 mpg for MY 1985.

DATES: Effective Date: April 4, 1990. These exemptions and alternative standards apply to the respective above mentioned manufacturers for the stated model years.

SUPPLEMENTARY INFORMATION: NHTSA is exempting three low volume manufacturers from the generally applicable average fuel economy standards for passenger automobiles and establishing alternative standards applicable to those companies for the petitioned model years as follows: Lamborghini for MYs 1983 and 1984; LondonCoach for MYs 1985 through 1987; and Maserati for MYs 1984 and 1985.

These exemptions are issued under the authority of section 502(c) of the Motor Vehicle Information and Cost Savings Act, as amended ("the Act") (15 U.S.C. 2002(c)). Section 502(c) provides that a passenger automobile manufacturer which manufactures fewer than 10,000 vehicles annually may be exempted from the generally applicable average fuel economy standard for a particular model year if that standard is greater than the low volume manufacturer's maximum feasible average fuel economy and if NHTSA establishes an alternative standard applicable to that manufacturer at its maximum feasible average fuel economy. In determining the manufacturer's maximum feasible average fuel economy, section 502(e) of the Act (15 U.S.C. 2002(e)) requires NHTSA to consider:

(1) Technological feasibility;

(2) Economic practicability;

(3) The effect of other Federal motor vehicle standards on fuel economy; and

(4) The need of the Nation to conserve energy.

This final decision was preceded by proposed decisions announcing the agency's tentative conclusion that the subject manufacturers should be exempted from the generally applicable average fuel economy standards for the petitioned model years, and that alternative standards should be established for the manufacturers for each of the model years; 54 FR 40689 (October 3, 1989), for Lamborghini, LondonCoach, and Maserati.

The agency received one comment on the October 3, 1989 notice from Maserati. Maserati endorsed the establishment of alternative standards for Maserati for MYs 1984 and 1985, but noted a "typographical error" in the summary section of the notice of proposed rulemaking (NPRM) where it was stated that the proposed alternative standards for Maserati was 17.3 mpg for MY 1984 and 16.6 mpg for MY 1985 rather than 17.9 mpg for MY 1984 and 16.8 mpg for MY 1985 as shown in the proposed amendment language at the end of the NPRM. The agency agrees with Maserati that the values in the summary of the NPRM are outdated. The discrepancy is that the first set of values were those requested in Maserati's petition while the second set are values that reflect Maserati's final adjusted CAFE as confirmed by the Environmental Protection Agency. Since 17.9 mpg for MY 1984 and 16.8 mpg for MY 1985 are the actual final CAFE values for Maserati, it is these values that will be used as the alternative fuel economy standards for Maserati.

Therefore, the agency is adopting the tentative conclusions set forth in the proposed decisions as its

final conclusions, for the reasons set forth in the proposed decisions. Based on the conclusions that the maximum feasible average fuel economy levels for each of the petitions during the applicable model years would be as shown below, that other Federal motor vehicle standards would not affect achievable fuel economy beyond the extent considered in this analysis, and that the national effort to conserve energy will not be affected by the granting of these requested exemptions, NHTSA hereby exempts the three petitioners from the generally applicable average fuel economy standards and establishes alternative standards for the three petitioners for the model years and at the levels shown below.

Section 531.5(b) is amended by revising (b)(7) and by adding (b)(8) and (b)(9). The introductory text of (b) is republished to read as follows:

§531.5 Fuel economy standards.

* * * * *

(b) The following manufacturers shall comply with the standards indicated below for the specified model years:

* * * * *

(7) Officine Alfieri Maserati S.p.A.

MODEL YEAR	AVERAGE FUEL ECONOMY STANDARD (miles per gallon)
1978	12.5
1979	12.5
1980	9.5
1984	17.9
1985	16.8

(8) Lamborghini of North America

MODEL YEAR	AVERAGE FUEL ECONOMY STANDARD (miles per gallon)
1983	13.7
1984	13.7

(9) LondonCoach Co., Inc.

MODEL YEAR	AVERAGE FUEL ECONOMY STANDARD (miles per gallon)
1985	21.0
1986	21.0
1987	21.0

Issued on: March 30, 1990

Jeffrey R. Miller
Deputy Administrator

55 F.R. 12485
April 4, 1990

PREAMBLE TO AN AMENDMENT TO PART 531
Passenger Automobile Average Fuel Economy Standards
(Docket No. 90-18; Notice 1)

ACTION: Final decision.

SUMMARY: This decision is issued in response to a petition filed by Dutcher Motors, Inc. (Dutcher) requesting that it be exempted from the generally applicable average fuel economy standard of 26.0 miles per gallon (mpg) for model year (MY) 1986, 1987, and 1988 passenger automobiles, and that lower alternative standards be established for it. This decision exempts Dutcher and establishes alternative standards of 16.0 mpg for MY 1986, 16.0 mpg for MY 1987, and 16.0 mpg for MY 1988. The decision was preceded by publication of a notice requesting public comments.

DATES: Effective Date: August 21, 1990. These exemptions and alternative standards apply to Dutcher for Model Years 1986, 1987 and 1988.

SUPPLEMENTARY INFORMATION: NHTSA is exempting Dutcher from the generally applicable average fuel economy standard for 1986, 1987 and 1988 model year passenger automobiles and establishing an alternative standard applicable to Dutcher for those model years. This exemption is issued under the authority of section 502(c) of the Motor Vehicle Information and Cost Savings Act, as amended ("the Act") (15 U.S.C. 2002(c)). Section 502(c) provides that a passenger automobile manufacturer which manufactures fewer than 10,000 passenger automobiles annually may be exempted from the generally applicable average fuel economy standard for a particular model year if that standard is greater than the low volume manufacturer's maximum feasible average fuel economy and if NHTSA establishes an alternative standard for the manufacturer at its maximum feasible level. Section 502(e) of the Act (15 U.S.C. 2002(e)) requires NHTSA, in determining maximum feasible average fuel economy, to consider:

(1) Technological feasibility;

(2) Economic practicability;

(3) The effect of other Federal motor vehicle standards on fuel economy; and

(4) The need of the Nation to conserve energy.

This final decision was preceded by a proposed decision announcing the agency's tentative conclusion that Dutcher should be exempted from the generally applicable 1986, 1987 and 1988 passenger automobile average fuel economy standards, and that an alternative standard of 16.0 mpg should be established for Dutcher in each of those model years (55 FR 14439, April 18, 1990). No comments were received on the proposed decision.

The agency is adopting the tentative conclusions set forth in the proposed decision as its final conclusions, for the reasons set forth in the proposed decision. Based on the conclusions that the maximum feasible average fuel economy level for Dutcher in Model Years 1986, 1987 and 1988 is 16.0 mpg, that other Federal motor vehicle standards will not affect achievable fuel economy beyond the extent considered in the proposed decision, and that the national effort to conserve energy will not be affected by granting this requested exemption, NHTSA hereby exempts Dutcher from the generally applicable passenger automobile average fuel economy standard for the 1986, 1987 and 1988 model years and establishes an alternative standard of 16.0 miles per gallon for Dutcher for each of those years.

In consideration of the foregoing, 49 CFR Part 531 is amended by adding §531.5(b)(11) to read as follows. The introductory text of (b) is shown for the convenience of the reader and remains unchanged.

* * * * *

(b) The following manufacturers shall comply with the standards indicated below for the specified model years:

* * * * *

(11) Dutcher Motors, Inc.

MODEL YEAR	AVERAGE FUEL ECONOMY STANDARD (miles per gallon)
1986	16.0
1987	16.0
1988	16.0

Issued on: August 14, 1990

Jeffrey R. Miller
Deputy Administrator

55 F.R. 34017
August 21, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 531

Passenger Automobile Average Fuel Economy Standards

(Docket No. LVM 89-01; Notice 6)

ACTION: Final Decision.

SUMMARY: This decision is issued in response to a petition filed by Rolls-Royce Motors, Ltd. (Rolls-Royce) requesting that it be exempted from the generally applicable average fuel economy standard of 27.5 miles per gallon (mpg) for model year (MY) 1992, 1993, and 1994 passenger automobiles, and that lower alternative standards be established for it. This decision exempts Rolls-Royce and establishes alternative standards of 13.8 mpg for MY 1992, 13.8 mpg for MY 1993, and 13.8 mpg for MY 1994. The decision was preceded by publication of a notice requesting public comments.

DATES: Effective Date: October 11, 1990. These exemptions and alternative standards apply to Rolls-Royce for model years 1992, 1993 and 1994.

SUPPLEMENTARY INFORMATION: NHTSA is exempting Rolls-Royce from the generally applicable average fuel economy standard for 1992, 1993 and 1994 model year passenger automobiles and establishing an alternative standard applicable to Rolls-Royce for those model years. This exemption is issued under the authority of section 502(c) of the Motor Vehicle Information and Cost Savings Act, as amended ("the Act")(15 U.S.C. 2002(c)). Section 502(c) provides that a passenger automobile manufacturer which manufactures fewer than 10,000 passenger automobiles annually may be exempted from the generally applicable average fuel economy standard for a particular model year if that standard is greater than the low volume manufacturer's maximum feasible average fuel economy and if NHTSA establishes an alternative standard for the manufacturer at its maximum feasible level. Section 502(e) of the Act (15 U.S.C. 2002(e)) requires NHTSA, in determining maximum feasible average fuel economy, to consider:

(1) Technological feasibility;

(2) Economic practicability;

(3) The effect of other Federal motor vehicle standards on fuel economy; and

(4) The need of the Nation to conserve energy.

This final decision was preceded by a proposed decision announcing the agency's tentative conclusion that Rolls-Royce should be exempted from the generally applicable 1992, 1993 and 1994 passenger automobile average fuel economy standards, and that an alternative standard of 13.8 mpg should be established for Rolls-Royce in each of those model years (55 FR 21626, May 25, 1990). No comments were received on the proposed decision.

The agency is adopting the tentative conclusions set forth in the proposed decision as its final conclusions, for the reasons set forth in the proposed decision. Based on the conclusions that the maximum feasible average fuel economy level for Rolls-Royce in model years 1992, 1993 and 1994 is 13.8 mpg, that other Federal motor vehicle standards will not affect achievable fuel economy beyond the extent considered in the proposed decision, and that the national effort to conserve energy will not be affected by granting this requested exemption. NHTSA hereby exempts Rolls-Royce from the generally applicable passenger automobile average fuel economy standard for the 1992, 1993 and 1994 model years and establishes an alternative standard of 13.8 miles per gallon for Rolls-Royce for each of those years.

NHTSA has analyzed this decision, and determined that neither Executive Order 12291 nor the Department of Transportation's regulatory policies and procedures apply, because this decision is not a "rule," which term is defined as "an agency statement of general applicability and future effect." This exemption is not generally applicable, since it applies only to Rolls-Royce. If the Executive Order and the Departmental policies and procedures were applicable, the agency would have determined that this action is neither "major" nor "significant." The principal impact of this exemption is that Rolls-Royce will not be required to pay civil penalties if they achieve CAFE levels equivalent to the alternative standards established in this notice. Since this decision sets an alternative standard at the level determined to be Rolls-Royce's maximum feasible average fuel economy, no fuel would be saved by establishing a higher alternative standard. The impacts for the public at large will be minimal.

The agency has also considered the environmental implications of this decision in accordance with the National Environmental Policy Act and determined that this decision will not significantly affect the human environment. Regardless of the fuel economy of a vehicle, it must pass the emissions standards which measure the amount of emissions per mile travelled. Thus, the quality of the air is not affected by this exemption and alternative standard. Further, since Rolls-Royce's MY 1992, 1993 and 1994 automobiles cannot achieve better fuel economy than 13.8 mpg, granting this exemption will not affect the amount of gasoline available.

Since the Regulatory Flexibility Act may apply to a decision exempting a manufacturer from a generally applicable standard, I certify that this decision will not have a significant economic impact on a substantial number of small entities. This decision does not impose any burden on Rolls-Royce. It does relieve the company from having to pay civil penalties for noncompliance with the generally applicable standards for model years 1992, 1993, and 1994. Since the prices of 1992, 1993 and 1994 Rolls-Royce automobiles will not be affected by this decision, the purchasers will not be affected. Generally, small businesses, small governmental jurisdictions, and small nonprofit entities are not purchasers of Rolls-Royce automobiles.

In consideration of the foregoing, 49 CFR Part 531 is amended to read as follows.

PART 531—[AMENDED]

1. The authority citation for Part 531 continues to read as follows:

Authority: 15 U.S.C. 2002, delegation of authority at 49 CFR 1.50.

2. Section 531.5(b) is amended by revising (b)(2). The introductory text of (b) is republished to read as follows:

§ 531.5 Fuel economy standards.

* * * *

(b) The following manufacturers shall comply with the standards indicated below for the specified model years:

* * * *

(2) Rolls-Royce Motors, Ltd.

MODEL YEAR	AVERAGE FUEL ECONOMY STANDARD (miles per gallon)
1978	10.7
1979	10.8
1980	11.1
1981	10.7
1982	10.6
1983	9.9
1984	10.0
1985	10.0
1986	11.0
1987	11.2
1988	11.2
1989	11.2
1990	12.7
1991	12.7
1992	13.8
1993	13,8
1994	13.8

* * * *

Issued on: September 5, 1990.

Jeffrey R. Miller
Deputy Administrator

55 F.R. 37326
September 11, 1990

PART 531—AVERAGE FUEL ECONOMY STANDARDS FOR PASSENGER AUTOMOBILES

S531.1 Scope.

This part establishes average fuel economy standards pursuant to section 502(a) of the Motor Vehicle Information and Cost Savings Act, as amended, for passenger automobiles.

S531.2 Purpose.

The purpose of this part is to increase the fuel economy of passenger automobiles by establishing minimum levels of average fuel economy for those vehicles.

S531.3 Applicability.

This part applies to manufacturers of passenger automobiles.

S531.4 Definitions.

(a) *Statutory terms.* (1) The terms "average fuel economy," "manufacture," "manufacturer," and "model year" are used as defined in section 501 of the Act.

(2) The terms "automobile" and "passenger automobile" are used as defined in section 501 of the Act and in accordance with the determination in part 523 of this chapter.

(b) *Other terms.* As used in this part, unless otherwise required by the context—

(1) "Act" means the Motor Vehicle Information and Cost Savings Act, as amended by Pub. L. 94-163.

S531.5 Fuel economy standards.

(a) Except as provided in paragraph (b) of this section each manufacturer of passenger automobiles shall comply with the following standards in the model years specified:

Model year	*Average fuel economy standard (miles per gallon)*
1978	18.0
1979	19.0
1980	20.0
1981	22.0
1982	24.0
1983	26.0
1984	27.0
1985	27.5
1986	26.0
1987	26.0
1988	26.0
1989	26.5
1990 and thereafter	27.5

(b) The following manufacturers shall comply with the standards indicated below for the specified model years:

(1) Aston Martin Lagonda, Inc.

Average Fuel Economy Standard

Model year	*Miles per gallon*
1979	11.5
1980	12.1
1981	12.2
1982	12.2
1983	11.3
1984	11.3
1985	11.4

(2) Avanti Motor Corporation.

Average Fuel Economy Standard

Model year	*Miles per gallon*
1978	16.1
1979	14.5
1980	15.8
1981	18.2
1982	18.2
1983	16.9
1984	16.9
1985	16.9

(3) Checker Motors Corporation.

Average Fuel Economy Standard

Model year	Miles per gallon
1978	17.6
1979	16.5
1980	18.5
1981	18.3
1982	18.4

(4) Dutcher Motors, Inc.

Average Fuel Economy Standard

Model year	Miles per gallon
1986	16.0
1987	16.0
1988	16.0

(5) Excalibur Automobile Corporation.

Average Fuel Economy Standard

Model year	Miles per gallon
1978	11.5
1979	11.5
1980	16.2
1981	17.9
1982	17.9
1983	16.6
1984	16.6
1985	16.6

(6) Lamborghini of North America

Average Fuel Economy Standard

Model year	Miles per gallon
1983	13.7
1984	13.7

(7) London Coach Co., Inc.

Average Fuel Economy Standard

Model year	Miles per gallon
1985	21.0
1986	21.0
1987	21.0

(8) Officine Alfieri Maserati S.p.A.

Average Fuel Economy Standard

Model year	Miles per gallon
1978	12.5
1979	12.5
1980	9.5
1984	17.9
1985	16.8

(9) Rolls-Royce Motors, Inc.

Average Fuel Economy Standard

Model year	Miles per gallon
1978	10.7
1979	10.8
1980	11.1
1981	10.7
1982	10.6
1983	9.9
1984	10.0
1985	10.0
1986	11.0
1987	11.2
1988	11.2
1989	11.2
1990	12.7
1991	12.7
[1992	13.8
1993	13.8
1994	13.8

(55 F.R. 37326—September 11, 1990. Effective: October 11, 1990)]

S531.6 Measurement and calculation procedures.

(a) The average fuel economy of all passenger automobiles that are manufactured by a manufacturer in a model year shall be determined in accordance with procedures established by the Administrator of the Environmental Protection Agency under section 502(a) (1) of the Act and set forth in 40 CFR Part 600.

42 F.R. 33534
June 30, 1977

PREAMBLE TO PART 538
Minimum Driving Range for Dual Energy and Natural Gas Dual Energy Passenger Cars

(Docket No. 89-09; Notice 3)
RIN 2127-AD02

ACTION: Final rule.

SUMMARY: This rule establishes minimum driving range standards for the operation of dual energy and natural gas dual energy passenger automobiles on non-petroleum fuel. Promulgation of minimum driving range standards for these vehicles is required by the 1988 amendments to the Motor Vehicle Information and Cost Savings Act. Dual energy passenger automobiles are those capable of operating on alcohol and either gasoline or diesel fuel, and natural gas dual energy passenger automobiles are those capable of operating on natural gas and either gasoline or diesel fuel. The minimum range for dual energy passenger automobiles is 200 miles, and the minimum range for natural gas dual energy passenger automobiles is 100 miles. A new passenger automobile which meets the applicable range and other criteria established by the 1988 amendments qualifies to have its fuel economy calculated according to a special procedure. Under that procedure, a relatively high fuel economy figure is assigned the vehicle thus encouraging its production as a way of facilitating a manufacturer's compliance with the Corporate Average Fuel Economy Standards.

This notice also establishes procedures for manufacturers to follow in petitioning the agency to establish a lower driving range for a particular model or models of natural gas dual energy passenger automobiles and for the agency to follow in establishing such lower ranges. It also enables the agency to set lower ranges for specific models of natural gas dual energy automobiles on its own initiative.

This rulemaking was initiated on June 15, 1989 (54 FR 25539), with the publication of a request for comments on the minimum driving range criteria. A notice of proposed rulemaking was published on February 16, 1990 (55 FR 5633).

DATES: These requirements are effective May 29, 1990.

SUPPLEMENTARY INFORMATION: This final rule establishes minimum driving range requirements for dual energy and natural gas dual energy passenger automobiles. Dual energy passenger automobiles are those which are capable of operation on alcohol and gasoline or diesel fuel. Natural gas (NG) dual energy passenger automobiles are those which are capable of operation on natural gas and either gasoline or diesel fuel. This preamble will use these terms to distinguish between these two types of vehicles. The term "dual fuel" vehicles will be used to refer collectively to both types of vehicles.

1. *Statutory Background*

Section 6 of the Alternative Motor Fuels Act of 1988 (Pub. L. 100–494, October 14, 1988) amended the fuel economy provisions of the Motor Vehicle Information and Cost Savings Act (Cost Savings Act) by adding a new section 513, containing incentives for the manufacture of vehicles designed to operate on alternative motor fuels, including dual fuel vehicles. Section 513 provides, inter alia, that the Secretary of Transportation must establish, by April 16, 1990, two minimum driving ranges, one for dual energy automobiles when operating on alcohol, and the other for natural gas dual energy automobiles when operating on natural gas. In establishing the driving ranges, the Secretary is required to consider the purposes of the Alternative Motor Fuels Act, consumer acceptability, economic practicability, technology, environmental impacts, safety, driveability, performance, and any other factors the Secretary deems relevant.

The Act and its legislative history make clear that the driving ranges are to be low enough to encourage the production of dual fuel passenger automobiles, yet not so low that motorists would be discouraged by a low driving range from actually fueling their vehicles with the alternate fuels. Section 513(h)(2)(C) provides that the range for dual energy automobiles may not be less than 200 miles. Section 513(h)(2)(B) allows passenger automobile manufacturers to petition the agency to set a lower range for a particular model or models than the general range established by the agency for all models. However, the range may not be reduced to less than 200 miles for any model of dual energy automobile.

Neither minimum driving range is a mandatory

requirement, but one of several statutory criteria which a new passenger automobile must satisfy in order to fall within the definition in section 513(h) for dual energy or natural gas dual energy automobiles. The other criteria which a passenger automobile must meet in order to be considered a dual energy automobile are that it be an automobile:

"(i) which is capable of operating on alcohol and on gasoline or diesel fuel;

(ii) which provides equal or superior energy efficiency, as calculated for the applicable model year during fuel economy testing for the Federal Government, while operating on alcohol as it does while operating on gasoline or diesel fuel; (and)

(iii) which, for model years 1993 through 1995, and, if the Administrator of the Environmental Protection Agency determines that an extension of this clause is warranted, for an additional period ending not later than the end of the last model year for which section 513(b) and (d) applies, provides equal or superior energy efficiency, as calculated during fuel economy testing for the Federal Government, while operating on a mixture of alcohol and gasoline or diesel fuel containing exactly 50 percent gasoline or diesel fuel as it does while operating on gasoline or diesel fuel[.]"

The other criteria which a passenger automobile must meet in order to be considered a natural gas dual energy automobile are that it be an automobile:

"(i) which is capable of operating on natural gas and on gasoline or diesel fuel; (and)

(ii) which provides equal or superior energy efficiency, as calculated for the applicable model year during fuel economy testing for the Federal Government, while operating on natural gas as it does while operating on gasoline or diesel fuel[.]"

By meeting these criteria, dual fuel automobiles qualify for special treatment in the calculation of their fuel economy for purposes of their manufacturers' compliance with the Corporate Average Fuel Economy Standards starting in MY 1993. The fuel economy of a dual energy passenger automobile would be the average of two values, the automobile's fuel economy when operating on gasoline or diesel fuel, and its fuel economy when operating on alcohol. Section 513(a) provides that, for the purposes of calculating that latter value, a gallon of alcohol is considered to contain 0.15 gallons of gasoline or diesel fuel. Thus, an automobile that runs 20 miles on a gallon of alcohol would be considered to have a fuel economy of 133 miles per gallon ((1/.15) × (20)) when operating on alcohol.

Similarly, the fuel economy of a natural gas dual energy passenger automobile would be the average of two values, the automobile's fuel economy when operating on gasoline or diesel fuel, and its fuel economy when operating on natural gas. Section 513(c) provides that, for the purposes of calculating the fuel economy of an automobile while operating on natural gas, 100 cubic feet of natural gas is considered to contain 0.823 gallons equivalent of natural gas and a gallon equivalent of natural gas is considered to contain 0.15 gallons of gasoline or diesel fuel.

Manufacturers can take advantage of these special calculation procedures in model years 1993 through 2004. The agency is authorized to extend this period up to an additional four years if it issues a rule for that purpose before January 1, 2002.

Section 513(g) limits the CAFE benefit that a manufacturer can receive in any single model year from producing automobiles that meet the above requirements. The total increase permitted in a manufacturer's Corporate Average Fuel Economy (CAFE) is 1.2 miles per gallon in any of model years 1993 through 2004 in which the manufacturer produced those automobiles and 0.9 miles per gallon in any of model years 2005 through 2008, if the Secretary determines that an extension of the provision beyond model year 2004 is warranted.

The agency notes that the statute does not require that all or even some minimum number or percentage of a manufacturer's passenger automobiles be capable of achieving the minimum driving ranges in order for any of its automobiles to qualify for the incentives. However, automobiles that do not meet the applicable minimum driving range do not qualify.

NHTSA concludes that the fuel economy value for each model type as determined using EPA test procedures is the appropriate measure for purposes of section 513. Sections 513(b) and (d) specify that the measurements are to be made under section 503(d). The latter provides that, except for the purposes of labeling under section 506, the procedures used shall be those "utilized by the EPA Administrator for model year 1975 . . . or procedures which yield comparable results."

2. *Regulatory Background*

As a first step in establishing minimum driving range criteria for dual fuel vehicles, NHTSA published a Request for Comments on June 15, 1989 (54 FR 25539). The notice asked several questions regarding dual energy passenger automobiles and natural gas dual energy passenger automobiles relative to the following criteria: consumer acceptability; economic practicability; technology; environmental impacts; safety; driveability; and performance.

Comments were received from several manufacturers and natural gas associations. Based largely on information obtained from these comments,

NHTSA published a notice of proposed rulemaking (NPRM) on February 16, 1990 (55 FR 5633). This notice proposed a minimum driving range requirement for dual energy passenger automobiles of 200 miles on one tank of alcohol fuel in order to be treated as a dual energy automobile, and a minimum range of 100 miles between refueling stops for a passenger automobile operating on natural gas to be treated as a NG dual energy automobile and thus qualify for the incentive provided in section 513. The NPRM also proposed procedures to enable manufacturers to petition the agency to set a lower minimum standard for specific models of NG dual energy vehicles unable to comply with the generally applicable standard. These procedures would not be available for dual energy vehicles since the proposed generally applicable standard was set at the statutory minimum of 200 miles.

As stated in the NPRM, the agency tentatively concluded these levels satisfy the twin goals of being low enough to encourage the production of dual fuel passenger automobiles, yet high enough to ensure that motorists not be discouraged from actually fueling and driving those automobiles on the alternative fuels.

3. *Dual Energy Driving Range Requirements*

NHTSA received comments on the NPRM from General Motors (GM), Ford, Chrysler, Nissan, Volvo, the Center for Auto Safety (CFAS), the National Automobile Dealers Association (NADA) and one individual commenter. GM, Ford, Chrysler, Nissan, Volvo, and CFAS supported the proposed 200 mile minimum range. NADA recommended a 250 mile minimum, while the individual commenter recommended a 275 mile minimum driving range.

In support of the 200 mile minimum, the manufacturers indicated that a minimum range above this level could result in the need for extensive modifications and redesign of vehicles. Volvo simply indicated that vehicle redesign would be necessary to accommodate the larger fuel tanks that would be required. GM stated that its current vehicles do not have unused space around the fuel tank, and that as a result, larger fuel tanks would require substantial redesign, consuming considerable engineering, tooling and testing resources. GM also indicated the redesign process would be costly, and could delay the introduction of dual energy vehicles. The company also noted that the increased cost and resulting price increase could discourage potential customers from purchasing the vehicles.

Chrysler stated that while minor increases in fuel tank capacity (1.5–2.0 gallons) could be accomplished for an estimated cost of $20–$25 per vehicle, more substantial increases would necessitate major design changes. Chrysler believes that a 5–10 percent increase beyond that stated above could add $75–$100 to the price of these cars. While not providing specific figures, Ford shared Chrysler's position that a slight increase in the tank capacity of some models may be possible at relatively low costs, but that significant redesign would be necessary to substantially increase capacity, and that the cost of doing so would impair the marketability of dual energy vehicles.

Ford also suggested that NHTSA revise §538.5 of the proposed rule to refer to "nominal usable fuel tank capacity" instead of "full tank capacity." The former has a common industry understanding, and is used in the manufacturers' applications to EPA for certification. It also takes into account the fact that certain areas within each tank design cannot be filled with fuel (e.g., areas above the filler inlet opening). NHTSA agrees that this term more accurately reflects usable capacity, and has revised the final rule accordingly.

Although CFAS supported the 200 mile range, its support is based on its general opposition to increased use of methanol as a motor fuel, and because of its opposition to the granting of CAFE credits to manufacturers of dual fuel vehicles. However, these issues are beyond the scope of this rulemaking. NHTSA notes, moreover, that the CAFE credits for manufacturers of dual fuel vehicles complying with the other requirements set out above are mandated by statute.

NADA supported a 250 mile range due to concerns about consumer acceptability. The Association believes that vehicles capable of only a 200 mile range will be unacceptable to consumers. In addition, NADA stated that the vast majority of MY 1989 passenger automobiles could achieve a 250 mile range, and that those vehicles which are likely candidates for conversion to dual energy vehicles, but cannot currently meet that criterion could be modified at a reasonable cost by MY 1993. NADA disagrees with NHTSA's assumption in the NPRM that the reduced range of dual energy vehicles would be offset by improved performance characteristics, because NADA believes this assumption is only valid if the alternative fuels are reasonably available.

The individual commenter recommended a 275 mile minimum range based upon marketing and geographical concerns. The commenter believes that a 200 mile range is not practical, and therefore is not marketable, and that minivans and other vehicles that blur the "conventional distinction between cars and trucks" will be the primary candidates for conversion to dual energy operation. The commenter maintains that these vehicles have greater fuel storage capacity. However, no data was supplied to support this contention. In addition, no information was provided to support the commenter's claim that 275 miles was an achievable range for the passenger

automobiles that are the subject of this rulemaking. NHTSA notes that under the Cost Savings Act, minivans and other "hybrid vehicles" are not considered "passenger automobiles," and are therefore not subject to the minimum driving range requirement or the CAFE incentives.

The commenter had other suggestions for improving the marketability of dual energy vehicles, including relaxing safety requirements. Those suggested actions are beyond the scope of this rulemaking.

The substantial majority of commenters supported NHTSA's proposed 200 mile minimum range for dual energy passenger automobiles. As noted above, the purpose behind the minimum range requirement is to encourage the manufacture and sale of dual energy vehicles. The agency believes that the range should be set at a level that would not impose unreasonable increased costs for fuel tank and structural changes in order to achieve that range. As pointed out by several commenters, these costs would be passed on in the form of higher vehicle prices to consumers, thereby affecting the competitiveness of these vehicles in the marketplace. NHTSA believes further that the range should be set at a level which gives the manufacturers broad flexibility in selecting the models to be offered with dual energy capability.

At the same time, NHTSA recognizes the importance of ensuring that the vehicles produced have a large enough range so as to be considered practical choices for consumers. It is likely that some consumers would reject a vehicle capable of only a 200 mile range.

However, since the range will be a minimum, not a maximum, and since consumer acceptability will be an important consideration of manufacturers in selecting which vehicles to offer with dual energy capability, the agency anticipates that the vast majority of dual energy vehicles offered for sale would likely be capable of driving ranges considerably higher than this minimum. As Ford noted in its response to the agency's Request for Comments, nearly 80 percent of its MY 1989 passenger fleet would be capable of achieving at least a 250 mile range if converted to dual energy operation. Likewise, GM noted that nearly 70 percent of its MY 1989 fleet would be above that figure. NHTSA believes that, instead of choosing to make all existing models available as dual energy models, manufacturers are likely to select those models capable of higher ranges as candidates for dual energy use. Consumers concerned about the range could choose those models. Moreover, since these vehicles have the potential to operate on alcohol, conventional fuels, or a combination of the two, consumers will always have the option of using conventional fuel in those instances where the reduced range is likely to create unusual problems (e.g., long distance travel through areas where alcohol fuels may not be easily available).

Based on its consideration of the available information, including the comments received and the factors set out in the Alternative Fuels Act, the agency concludes that 200 miles is an appropriate minimum driving range for dual energy passenger automobiles. The 200-mile range can be achieved without any increase in the size of existing fuel tanks, which would be used for both types of fuel. Thus, the agency believes the range is consistent with available technology.

Based on the comments received, NHTSA believes that setting a minimum driving range substantially higher than 200 miles would, in some instances, require fuel tanks that would be significantly larger than current tanks. In order to install a tank of that size, a manufacturer would have to redesign its automobiles. As noted in the manufacturer comments discussed above, the costs of doing so could be significant. In their comments, the manufacturers expressed a reluctance to redesign their automobiles and install larger tanks in order to achieve an alcohol driving range equivalent to that of a petroleum fuel passenger automobile. They stated that such a redesign could be extremely expensive and could make it necessary to recertify compliance with applicable Federal safety standards (e.g., FMVSS 301, Fuel System Integrity).

The 200 mile standard means that automobile manufacturers will not have to make compensatory design changes to ensure that the weight of a larger tank loaded to capacity with fuel would not adversely affect the braking, handling or performance of existing automobiles. A larger tank would exacerbate the variation in a vehicle's weight between the times that it has a full tank and the times that it has a nearly empty one. Manufacturers must design vehicles to take into account the effects which such variations in vehicle weight have on vehicle handling and braking. In addition, manufacturers would have to recertify that the vehicle, when loaded to its maximum weight, still meets all applicable safety standards.

Driving range for natural gas dual energy automobiles

The Alternative Fuels Act also requires that a minimum driving range be established for natural gas (NG) dual energy automobiles, although it does not specify that the range must equal or exceed some minimum value. The NPRM proposed a minimum range of 100 miles for NG dual energy automobiles.

GM, Ford, Chrysler, CFAS, NADA, the American Gas Association (AGA) and one individual commenter provided comments on the proposed range for NG dual energy vehicles.

GM suggested that the agency does not need to set a minimum range for NG dual energy automobiles at this time, but did not take issue with the 100 mile range coupled with the petition procedure which would enable manufacturers to petition for a lower minimum range for specific models of NG dual energy vehicles. The company pointed out that increasing the range of NG dual energy vehicles would be accomplished by using more or larger high pressure cylinders. This would result in increased costs and less storage space, as the cylinders are typically located in the trunk. GM is also concerned about the impact on driveability and potential loss of fuel economy from additional gas cylinders.

NHTSA notes that it has no discretion as to whether to set a minimum range for NG dual energy vehicles. Such a range is explicitly required by section 513(h)(2)(A) of the Cost Savings Act. The agency agrees that increasing the driving range of NG dual energy vehicles by increasing fuel storage space can have negative impacts on driveability and fuel economy.

Ford and Chrysler both supported the proposed range for NG dual energy vehicles, but both noted that they did not have a great deal of information on these vehicles. Ford emphasized that the costs of conversion to NG dual energy vehicles are very preliminary, and are likely to exceed by several times the incremental costs mentioned in the NPRM.

The AGA supported the proposed minimum range, and stated that the natural gas industry has concluded that the most cost effective current target for natural gas use is the fleet vehicle that returns to a central refueling station after each shift. AGA emphasized that it views NG dual energy propulsion as a technology "bridge" between current technology and improved future technology.

In its comments, the Association stated that since the targeted vehicles are those with access to a centralized refueling facility, they need not exceed the driving ranges that are now attained with natural gas conversion equipment now in use. The comments did not specify what this range is. Another consideration raised by the AGA concerned the use of NG dual energy propulsion in utility vehicle fleets. The AGA stated that these vehicles are frequently used to provide power for equipment, lighting and communications at service locations, and that this prolonged idling will reduce the effective driving range of these vehicles. However, NHTSA notes that the vehicles used in these applications are not typically passenger automobiles; rather, they are light trucks or MPVs which are not subject to this rulemaking.

NADA concurred that NG dual energy vehicles are likely to be used primarily in fleet service, with centralized refueling facilities, but did not express an opinion on the proposed minimum range.

CFAS recommended that the minimum range be set at 200 miles or slightly lower, because it believes a 100 mile range is impractical even for fleet applications, as vehicles would be unable to travel more than 50 miles away from refueling facilities. While CFAS says that direct use of natural gas is considerably more efficient than the use of natural gas to produce methanol, and that natural gas has environmental benefits, it opposes encouraging the use of natural gas through the granting of CAFE credit. CFAS believes it is inappropriate for manufacturers to receive this credit for manufacturing a car that is likely to see little use with natural gas.

CFAS provided no information to support its recommendation of a 200 mile range as a practical range. Based on the information available to it, NHTSA believes that a minimum range at that level would be viewed as impractical by manufacturers and would serve to discourage the production of NG dual energy vehicles. While CFAS's objections to the incentives chosen by Congress to encourage the use of alternative fuels are beyond the scope of this rulemaking, NHTSA notes that it is unlikely that consumers would be willing to pay the considerable increased costs for a NG dual energy automobile unless they actually intended to operate it on natural gas. NHTSA thus disagrees with the group's position that manufacturers will, in effect be receiving a CAFE "bonus" for producing vehicles that are unlikely to be operated on natural gas.

The individual commenter recommended that the minimum range for NG dual energy vehicles be set at 200 miles for the same reasons that he recommended a higher range for dual energy vehicles. These are discussed above. Like CFAS, he provided no information to support his contention that such a range is achievable. NHTSA disagrees with this recommendation for the reasons stated above.

NHTSA believes that a 100-mile range will not lead to the production of vehicles with so low a natural gas operating range that it would impede the development and sale of natural gas dual energy vehicles. The agency notes that a natural gas dual energy vehicle still has the gasoline fuel tank as a range extender. In addition, the 100-mile criterion represents a minimum range that would likely be exceeded by vehicle manufacturers. Market forces will assure that vehicles will not be produced unless purchasers are satisfied with their capabilities.

Based on its consideration of the information available, including the comments discussed above,

and the factors set forth in the Alternative Motor Fuels Act, the agency concludes that NG dual energy passenger automobiles can achieve a minimum driving range of 100 miles while operating on natural gas.

On average, the cost of natural gas fuel tanks needed to achieve a 100 mile range would be from $386–$579, depending on design and construction material.

In order to achieve a higher range, vehicles would have to be equipped with additional storage tanks. Doing this would pose significant problems since weight and available space are limiting factors. As noted above, for the 100-mile range, the additional tanks would cost $386 to $579 and add $46 to lifetime fuel costs due to the added weight. In addition, these tanks would reduce available trunk space by about 3.4 cubic feet. The added weight would have a negative impact on vehicle performance and driveability.

The agency believes that the 100 mile range is sufficient to meet the needs of the likely purchasers of natural gas dual energy automobiles. The agency agrees with the commenters that suggest the most likely passenger automobiles that would be converted to burn natural gas are fleet passenger automobiles and taxis because of their high annual fuel consumption and access to central company-owned refueling facilities. Access to such facilities would enable these companies to accommodate the range established by this rule. This range might be less adequate for private owners of natural gas passenger automobiles since they may have limited access to natural gas refueling facilities. Therefore, for the private owner, driving range is likely to be a major factor in the selection of a natural gas dual energy automobile until refueling facilities are more plentiful. The agency believes that the 100 mile range represents an achievable level, consistent with available technology which will not be unduly impractical or have negative impacts upon consumer acceptability, vehicle driveability or performance.

Presently, the agency is not aware of any significant safety risks associated with alcohol or natural gas fuel for dual energy passenger automobiles attributed specifically to the magnitude of vehicle driving range or fuel tank size. All gasoline and diesel-powered automobiles are required to comply with FMVSS No. 301; *Fuel System Integrity.* Alcohol-powered vehicles are likewise required to comply with Standard 301. The natural gas fuel system of a natural gas dual energy vehicle will not be required to comply with Standard 301 because that standard applies only to vehicles which use a fuel having a boiling point above 32° F, while natural gas has a boiling point below 32° F. NHTSA expects to publish advance notices of proposed rulemaking later this year as part of its effort to determine whether additional requirements are necessary to enhance the safety of vehicles operating on alcohol or natural gas.

Procedures establishing lower driving ranges for particular models of natural gas dual energy automobiles

Section 513(h)(2)(B)(i) requires that the rule establishing the driving ranges also allow the agency to determine that a specific model or model type may have a lower range than the generally established range and establish procedures for manufacturers to petition the agency to specify such a lower range. As noted above, section 513(h)(2)(B)(ii) provides that lower ranges may not be established for dual energy automobiles if the agency selects the 200 mile statutory minimum as the driving range for those automobiles. Since this notice establishes that minimum value, the petitioning procedures apply only to natural gas dual energy automobiles. NHTSA received no comments on the substance of the proposed procedure for petitions, and the final rule makes no changes to these procedures.

The procedures specify that petitioning manufacturers must address each of the factors which the agency is required by section 513(h)(2)(D) to take into account in establishing lower driving ranges, i.e., the purposes of the Alternative Motor Fuels Act of 1988, consumer acceptability, economic practicability, technology, environmental impact, safety, driveability, performance, and any other factors the agency deems relevant. This notice does not establish any additional factors.

Following its receipt of a petition, the agency will publish a notice summarizing the petition and inviting public comment. Then the agency will consider the comments and other available information and publish a final decision in accordance with section 513(h)(2)(D).

In consideration of the foregoing, 49 CFR is amended by adding Part 538 to read as follows:

1. The authority citation for Part 538 reads as follows:

Authority: Sec. 6, Pub. L. 100–494, 100 Stat. 2448 (15 U.S.C. 2013); delegation of authority at 49 CFR 1.50.

2. A new Part 538 is added to read as follows:

PART 538—DRIVING RANGES FOR DUAL ENERGY AND NATURAL GAS DUAL ENERGY PASSENGER AUTOMOBILES

Secs.

§ 538.1 Scope.

This part establishes minimum driving range criteria to aid in identifying passenger automobiles that are either dual energy automobiles or natural gas dual energy automobiles. It also establishes procedures by which manufacturers may petition for a lower driving range for a specific model of natural gas dual energy automobile and by which the agency may grant or deny such petitions.

§ 538.2 Purpose.

The purpose of this part is to specify one of the criteria in section 513(h) of the Act for identifying dual energy and natural gas dual energy passenger automobiles that are manufactured in model years 1993 through 2004. The fuel economy of these passenger automobiles is calculated in a special manner so as to facilitate the compliance of their manufacturers with the Corporate Average Fuel Economy Standards set forth in Part 531 of this title and thereby encourage the production of such vehicles.

§ 538.3 Applicability.

This part applies to manufacturers of passenger automobiles that are either dual energy or natural gas dual energy passenger automobiles manufactured during model years 1993–2004.

§ 538.4 Definitions.

(a) Statutory terms. (1) The terms *dual energy automobile, natural gas dual energy automobile,* and *alcohol* are used as defined in section 513 of title V of the Act.

(2) The terms *automobile* and *passenger automobile*, are used as defined in section 501 of the Act and in accordance with the determinations in part 523 of this chapter.

(3) The term *manufacturer* is used as defined in section 501 of the Act and in accordance with part 529 of this chapter.

(4) The term *model year* is used as defined in section 501 of the Act.

(5) As used in this part, unless otherwise required by the context: *Act* means the Motor Vehicle Information and Cost Savings Act (Pub. L. 92–513), as amended.

(b) Other terms. The terms *average fuel economy, fuel economy,* and *model type* are used as defined in subpart A of 40 CFR part 600.

§ 538.5 Minimum driving range.

(a) The minimum driving range which a passenger automobile must have in order to be treated as a dual energy automobile pursuant to section 513(1)(C) of the Act is 200 miles when operating on its nominal usable fuel tank capacity of alcohol fuel.

(b) Except as provided in § 538.7, the minimum driving range which a passenger automobile must have in order to be treated as a natural gas dual energy automobile pursuant to section 513(1)(D) of the Act is 100 miles when operating on its nominal fuel tank capacity of natural gas.

(c) The Administrator may determine that a specific model type or types of natural gas dual energy automobiles may have a lower range than that specified in paragraph (b) of this section and still qualify as a natural gas dual energy automobile for purposes of the section. In making such a determination, the Administrator takes into account the factors specified in § 538.7(f).

§ 538.6 Measurement of driving range.

The driving range of a passenger automobile model type is determined by multiplying the combined EPA city/highway fuel economy when operating on the alcohol or natural gas fuel by the nominal usable fuel tank capacity in gallons, of the fuel tank containing the alcohol or natural gas. The combined EPA city/highway fuel economy is the value determined by the procedures established by the Administrator of the Environmental Protection Agency under section 503(d) of the Act and set forth in 40 CFR 600.

§ 538.7 Petitions for reduction of minimum driving range.

(a) A manufacturer of a model type of passenger automobile capable of operating on both natural gas and either gasoline or diesel fuel may petition for a reduced minimum driving range for that model type in accordance with paragraphs (b) through (c) of this section.

(b) Each petition shall—

(1) Be addressed to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street SW., Washington, DC 20590.

(2) Be submitted not later than the beginning of the first model year in which the petitioner seeks to have the model type treated as a natural gas dual energy automobile.

(3) Be written in the English language.

(4) State the full name, address, and title of the official responsible for preparing the petition, and the name and address of the petitioner.

(5) Set forth in full data, views and arguments of the petitioner, including the information and data specified in § 538.7(b) and the calculations and analyses used to develop that information and data. No documents may be incorporated by reference in a petition unless the documents are submitted with the petition.

(6) Specify and segregate any part of the information and data submitted under this section that the petitioner wishes to have withheld from public disclosure in accordance with Part 512 of this chapter.

(c) Each petitioner shall include the following information in its petition.

(1) Identification of the model type or types for which a lower driving range is sought under this section.

(2) For each model type identified in accordance with paragraph (c)(1):

(i) The driving range sought for that model type.

(ii) The number of years for which that driving range is sought.

(iii) A description of the model type, including car line designation, engine displacement and type, natural gas fuel tank location and capacities, transmission type and average fuel economy when operating on:

(A) Natural gas, and

(B) Gasoline or diesel fuel.

(iv) An explanation of why the petitioner cannot modify the model type so as to meet the generally applicable minimum range, including the steps taken by the petitioner to improve the minimum range of the vehicle, as well as additional steps that are technologically feasible, but have not been taken. The costs to the petitioner of taking these additional steps shall be included.

(3) A discussion of why granting the petition would be consistent with the following factors:

(i) The purposes of the Alternative Motor Fuels Act, including encouraging the development and widespread use of natural gas as a transportation fuel by consumers, and the production of passenger automobiles capable of being operated on both natural gas and gasoline/diesel fuel;

(ii) Consumer acceptability;

(iii) Economic practicability;

(iv) Technology;

(v) Environmental impact;

(vi) Safety;

(vii) Driveability; and

(viii) Performance.

(d) If a petition is found not to contain the information required by this section, the petitioner is informed about the areas of insufficiency and advised that the petition will not receive further consideration until the required information is received.

(e) The Administrator may request the petitioner to provide information in addition to that required by this section.

(f) The Administrator publishes in the *Federal Register* a notice of receipt for each petition containing the information required by this section. Any interested person may submit written comments regarding the petition.

(g) In reaching a determination on a petition submitted under this section, the Administrator takes into account:

(1) The purposes of the Alternative Motor Fuels Act, including encouraging the development and widespread use of methanol, ethanol and natural gas as transportation fuels by consumers, and the production of alternative fuel powered motor vehicles;

(2) Consumer acceptability;

(3) Economic practicability;

(4) Technology;

(5) Environmental impact;

(6) Safety;

(7) Driveability; and

(8) Performance.

(i) The purposes of the Alternative Motor Fuels Act, including encouraging the development and widespread use of methanol, ethanol and natural gas as transportation fuels by consumers, and the production of alternative fuel powered motor vehicles;

(ii) Consumer acceptability;

(iii) Economic practicability;

(iv) Technology;

(v) Environmental impact;

(vi) Safety;

(vii) Driveability; and

(viii) Performance.

(h) If the Administrator grants the petition, the petitioner is notified in writing, specifying the model years for which it applies. He also publishes in the *Federal Register* a notice of the grant and the reasons for it.

(i) If the Administrator denies the petition, the petitioner is notified in writing. He also publishes in the *Federal Register* a notice of the denial and the reasons for it.

Issued on April 18, 1990

Jeffrey R. Miller
Deputy Administrator

55 F.R. 17611
April 26, 1990

PART 538—DRIVING RANGES FOR DUAL ENERGY AND NATURAL GAS DUAL ENERGY PASSENGER AUTOMOBILES

S538.1 Scope.

This part establishes minimum driving range criteria to aid in identifying passenger automobiles that are either dual energy automobiles or natural gas dual energy automobiles. It also establishes procedures by which manufacturers may petition for a lower driving range for a specific model of natural gas dual energy automobile and by which the agency may grant or deny such petitions.

S538.2 Purpose.

The purpose of this part is to specify one of the criteria in section 513(h) of the Act for identifying dual energy and natural gas dual energy passenger automobiles that are manufactured in model years 1993 through 2004. The fuel economy of these passenger automobiles is calculated in a special manner so as to facilitate the compliance of their manufacturers with the Corporate Average Fuel Economy Standards set forth in Part 531 of this title and thereby encourage the production of such vehicles.

S538.3 Applicability.

This part applies to manufacturers of passenger automobiles that are either dual energy or natural gas dual energy passenger automobiles manufactured during model years 1993-2004.

S538.4 Definitions.

(a) *Statutory terms.* (1) The terms "dual energy automobile," "natural gas dual energy automobile," and "alcohol" are used as defined in section 513 of Title V of the Act.

(2) The terms "automobile" and "passenger automobile," are used as defined in section 501 of the Act and in accordance with the determinations in Part 523 of this chapter.

(3) The term "manufacturer" is used as defined in section 501 of the Act and in accordance with Part 529 of this chapter.

(4) The term "model year" is used as defined in section 501 of the Act.

(5) As used in this part, unless otherwise required by the context: "Act" means the Motor Vehicle Information and Cost Savings Act (Pub. L. 92-513), as amended.

(b) *Other terms.* The terms "average fuel economy," "fuel economy," and "model type" are used as defined in Subpart A of 40 CFR Part 600.

S538.5 Minimum driving range.

(a) The minimum driving range which a passenger automobile must have in order to be treated as a dual energy automobile pursuant to section 513(1)(C) of the Act is 200 miles when operating on its nominal usable fuel tank capacity of alcohol fuel.

(b) Except as provided in § 538.7, the minimum driving range which a passenger automobile must have in order to be treated as a natural gas dual energy automobile pursuant to section 513(1)(D) of the Act is 100 miles when operating on its nominal fuel tank capacity of natural gas.

(c) The Administrator may determine that a specific model type or types of natural gas dual energy automobiles may have a lower range than that specified in paragraph (b) and still qualify as a natural gas dual energy automobile for purposes of the section. In making such a determination, the Administrator takes into account the factors specified in § 538.7(f).

S538.6 Measurement of driving range.

The driving range of a passenger automobile model type is determined by multiplying the combined EPA city/highway fuel economy when operating on the alcohol or natural gas fuel by the nominal usable fuel tank capacity in gallons, of the fuel tank containing the alcohol or natural gas. The combined EPA city/highway fuel economy is the value determined by the procedures established by the Administrator of the Environmental Protection Agency under section 503(d) of the Act and set forth in 40 CFR 600.

S538.7 Petitions for reduction of minimum driving range.

(a) A manufacturer of a model type of passenger automobile capable of operating on both natural gas

and either gasoline or diesel fuel may petition for a reduced minimum driving range for that model type in accordance with paragraphs (b)-(c).

(b) Each petition shall—

(1) Be addressed to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

(2) Be submitted not later than the beginning of the first model year in which the petitioner seeks to have the model type treated as a natural gas dual energy automobile.

(4) State the full name, address, and title of the official responsible for preparing the petition, and the name and address of the petitioner.

(5) Set forth in full data, views and arguments of the petitioner, including the information and data specified in § 53B.7(b) and the calculations and analyses used to develop that information and data. No documents may be incorporated by reference in a petition unless the documents are submitted with the petition.

(6) Specify and segregate any part of the information and data submitted under this section that the petitioner wishes to have withheld from public disclosure in accordance with Part 512 of this chapter.

(c) Each petitioner shall include the following information in its petition.

(1) Identification of the model type or types for which a lower driving range is sought under this section.

(2) For each model type identified in accordance with paragraph (c)(1):

(i) The driving range sought for that model type.

(ii) The number of years for which that driving range is sought.

(iii) A description of the model type, including car line designation, engine displacement and type, natural gas fuel tank location and capacities, transmission type and average fuel economy when operating on (1) natural gas, and (2) on gasoline or diesel fuel.

(iv) An explanation of why the petitioner cannot modify the model type so as to meet the generally applicable minimum range, including the steps taken by the petitioner to improve the minimum range of the vehicle, as well as additional steps that are technologically feasible, but have not been taken. The costs to the petitioner of taking these additional steps shall be included.

(3) A discussion of why granting the petition would be consistent with the following factors:

(i) The purposes of the Alternative Motor Fuels Act, including encouraging the development and widespread use of natural gas as a transportation fuel by consumers, and the production of passenger automobiles capable of being operated on both natural gas and gasoline/diesel fuel;

(ii) Consumer acceptability;

(iii) Economic practicability;

(iv) Technology;

(v) Environmental impact;

(vi) Safety;

(vii) Driveability; and

(viii) Performance.

(d) If a petition is found not to contain the information required by this section, the petitioner is informed about the areas of insufficiency and advised that the petition will not receive further consideration until the required information is received.

(e) The Administrator may request the petitioner to provide information in addition to that required by this section.

(f) The Administrator publishes in the *Federal Register* a notice of receipt for each petition containing the information required by this section. Any interested person may submit written comments regarding the petition.

(g) In reaching a determination on a petition submitted under this section, the Administrator takes into account:

(i) The purposes of the Alternative Motor Fuels Act, including encouraging the development and widespread use of methanol, ethanol and natural gas as transportation fuels by consumers, and the production of alternative fuel powered motor vehicles;

(ii) Consumer acceptability;

(iii) Economic practicability;

(iv) Technology;

(v) Environmental impact;

(vi) Safety;

(vii) Driveability; and

(viii) Performance.

(h) If the Administrator grants the petition, the petitioner is notified in writing, specifying the model years for which it applies. He also publishes in the *Federal Register* a notice of the grant and the reasons for it.

(i) If the Administrator denies the petition, the petitioner is notified in writing. He also publishes in the *Federal Register* a notice of the denial and the reasons for it.

55 F.R. 17611
April 26, 1990

PREAMBLE TO AN AMENDMENT TO PART 544
Motor Vehicle Theft Prevention; Reporting Requirements
(Docket No. T86–01; Notice 10)
RIN 2127–AC32

ACTION: Final rule.

SUMMARY: This final rule marks the culmination of a four-year effort by this agency to obtain the information necessary to implement authority for exempting a substantial number of self-insured motor vehicle rental and leasing companies from a statutory requirement to file annual theft data reports. To date, all self-insured rental and leasing companies with fleets of 20 or more motor vehicles have been required to file reports. Henceforth, theft reports will be required from only those rental and leasing companies (including franchisees and licensees) which have combined fleets of 50,000 or more vehicles. This change reduces the number of covered companies to fewer than two dozen.

The agency has taken this action after making two statutorily-specified determinations. First, NHTSA has determined that for those companies with combined fleets of fewer than 50,000 vehicles, the cost of preparing and furnishing such reports is excessive in relation to the size of the business of the insurer. Second, NHTSA has determined that reports from the largest rental and leasing companies would provide the agency with a representative sampling of the theft experience of rental and leasing companies.

DATE: *Effective Date*: This final rule is effective on July 23, 1990.

SUPPLEMENTARY INFORMATION:

Background: The Motor Vehicle Theft Law Enforcement Act of 1984 (Pub.L. 98–547; Theft Act) added Title VI to the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2021 *et seq.*; Cost Savings Act). Section 612 of the Cost Savings Act requires insurers to submit annual reports to NHTSA regarding a number of theft-related matters. As set forth in section 612(a)(2) of the Cost Savings Act, the reports are to include theft and recovery data, the rating rules and plans used by insurers to establish premiums for comprehensive insurance coverage for motor vehicles, and actions taken to reduce premiums, among other information.

In addition to including companies that issue insurance policies, the term "insurers" is defined in section 612 to include certain self-insurers, i.e., any person who has a fleet of 20 or more motor vehicles (other than any governmental entity) which are used primarily for rental or lease and which are not covered by theft insurance policies issued by insurers of passenger motor vehicles. (Section 612(a)(3)). The agency estimates that about 4,000 rental and leasing companies are "insurers" under this definition and are therefore required to file annual reports.

Section 612(a)(4) authorizes the agency to exempt certain insurers from submitting the reports, if the agency determines that:

(1) The cost of preparing and furnishing such reports is excessive in relation to the size of the business of the insurer, *and*

(2) The insurer's report will not significantly contribute to carrying out the purposes of Title VI.

The purpose of this notice is in effect to grant a class exemption to all companies that rent or lease fewer than 50,000 vehicles. This notice concludes a rulemaking proceeding begun with the issuance of a notice of proposed rulemaking on February 3, 1989 (54 *FR* 5519). NHTSA believes that reports from a representative sample of rental and leasing companies will provide the agency with the necessary information to allow it to fulfill all its obligations under Title VI of the Cost Savings Act. NHTSA concludes that reports by the many smaller rental and leasing companies do not significantly contribute to carrying out Title VI, and that exempting such companies will relieve an unnecessary burden on the vast majority of the companies presently subject to the reporting requirements.

When it issued the initial regulations under Title VI, NHTSA did not have sufficient information to allow it to make the first determination in section 612(a)(4), i.e., a determination that the cost of preparing and furnishing such reports is excessive in relation to the size of the business of the insurer. Absent such information, NHTSA was unable to exempt rental and leasing companies from the reporting requirements. Therefore, in a final rule published on January 2, 1987 (52 FR 59), NHTSA required each rental and leasing company which fell

within the definition of "insurer" to file an annual report with the agency. In the preamble to the final rule, the agency stated that it would consider individual requests for exemption from smaller rental and leasing companies, as long as they provided information that would enable the agency to make a determination under section 612(a)(4) that the cost of preparing and furnishing the reports is excessive in relation to the size of the insurer's business.

The agency received approximately 150 petitions for exemption for the October 25, 1987 reporting period. Many of the petitioners requested that their petitions be made applicable to subsequent years. Those petitions from smaller, independent rental and leasing companies were granted, but petitions from large, nationwide rental and leasing companies and their franchisees or licensees were denied.

Subsequent to the issuance of the January 1987 rule, the agency obtained information on the size of the fleets of rental and leasing companies and the market share for these companies. This information was obtained from the *Automotive Fleet Magazine* (for both rental and leasing companies) and *Travel Trade Business Travel News* (for rental companies only). These publications publish annual tabulations of the data which the motor vehicle rental and leasing companies voluntarily supply to them. Within the rental and leasing community, both publications are regarded as the most accurate data sources available for those businesses. NHTSA tentatively concluded that these sources are sufficiently accurate to determine which rental and leasing companies should be exempted from the theft reporting requirements.

Notice of Proposed Rulemaking

Using these data from the trade publications, the agency published a notice of proposed rulemaking (NPRM) (54 FR 5519, February 3, 1989) that explained how the agency proposed to make the statutory determinations that would exempt most self-insured rental and leasing companies from reporting. In the NPRM, the public was invited to comment on the several tentative conclusions reached by the agency in formulating the proposed rule. First, the agency had tentatively concluded that *Automotive Fleet* and *Travel Trade Business Travel News* were sufficiently accurate to be used in determining which rental and leasing companies should be exempted from the theft reporting requirements. Second, the agency tentatively concluded that franchisors and their franchisees or licensors and their licensees should be treated as single entities for purposes of reporting, with franchisors and licensors responsible for gathering the required data. The agency's rationale for this tentative decision was that since franchisees generally submit periodic reports to the franchisor in any case, it would be relatively simple to include information about theft experience. Further, NHTSA has no data on the size of all franchisees and licensees. Without this information, the agency had no basis to propose exemptions for rental and leasing companies if it were to treat each franchisee or licensee separately. Commenters who disagreed with this approach were asked to discuss how NHTSA could obtain franchisee number and fleet size information and to discuss whether the agency could structure an exemption from the reporting requirements for small rental and leasing companies while requiring reports from all franchisees of large franchisors. NHTSA also sought additional information on the structure and procedures used by franchise operations in the car rental business.

Third, using the trade publication information, the agency tentatively determined that a representative sample of the theft experience of vehicles other than passenger cars would be obtained if it received reports only from rental and leasing companies (including franchisees and licensees) with fleets of 50,000 or more vehicles.

Fourth, the agency tentatively determined that the costs of requiring rental and leasing companies with fewer than 50,000 vehicles in their fleet to prepare and furnish reports were excessive in relation to the size of the company's business and would not in any way contribute to the agency's carrying out its responsibilities under Title VI of the Cost Savings Act. NHTSA asked commenters who disagreed with this determination to explain why they believed that the purposes of Title VI would be furthered by reports from smaller companies.

Public Comments

The agency received a total of seven comments. All commenters supported the 50,000 vehicle threshold, and the general intent to exempt as many companies as possible from reporting requirements. One commenter argued that the costs of franchisors' providing theft data for franchisees is excessive in relation to the size of the business of the insurer, regardless of the company's size.

Chrysler Motors Corporation (Chrysler) and Volkswagen of America, Inc. (Volkswagen), two motor vehicle manufacturers not subject to the reporting requirements, wrote in support of the proposal, especially the 50,000 vehicle threshold. Chrysler offered a comment about the proposed change to wording in Section 544.3, the "Application" section that describes companies subject to the reporting requirements of Part 544. The NPRM had proposed that self-insured motor vehicle rental and leasing

companies subject to reporting requirements be described as:

> . . . persons (including licensees and franchisees) who have a fleet of 20 or more motor vehicles used primarily for rental or lease and not covered by theft insurance policies issued by an insurer of motor vehicles listed in Appendix C.

Chrysler stated that it believed that the agency had erred in developing the wording for the exemption in Section 544.3 since it did not correspond with the agency's intent to exclude from reporting requirements those self-insured rental and leasing companies with fleets of fewer than 50,000 vehicles. The agency notes that the description proposed is the statutory definition of "insurer" in Section 612(a)(3) of the Theft Act. However, the agency agrees that there may be less confusion if the description of the self-insured rental and leasing companies were more simply worded. Therefore, the regulatory text adopted in this notice simply describes these companies as "the motor vehicle rental and leasing companies listed in Appendix C."

Chrysler also stated the agency's proposal to update Appendix C annually in November to identify the companies which must report the following October did not provide sufficient lead time in preparing the required report for a calendar year. It suggested that the requirements be amended to give a company listed in Appendix C a full year to collect theft and recovery data for reporting to the agency the following year. Under the procedure recommended by Chrysler, a company added to Appendix C in November 1990, would begin collecting data for calendar year 1991 on January 1, 1991, and would file its first report in October 1992.

The agency is not adopting this recommendation, for the following reasons. Although there may be merit in this comment, NHTSA could not adopt the recommended change in this rulemaking because it is not within the scope of the notice. This agency will consider the comment further after the completion of this rulemaking. In doing so, the agency will examine the following factors which are relevant to making a decision about the appropriate interval between the agency's final determination regarding which companies must report and the time that the reports must be submitted. First, the time period proposed in the NPRM would allow a company about 10 months after final notification to gather the needed data for the preceding calendar year, arrange it into the appropriate format, and report it to the agency. Second, the insurers listed in Appendices A and B are required to report under an identical schedule. In order to avoid confusion, the reporting timeframe should be consistent for all reporting companies. The agency's experience with insurers subject to Appendices A and B has been that the time between the finalization of the list of insurers required to report and the due date of the annual theft report has not been a problem.

The National Automobile Dealers Association supported the agency's proposal to exempt all self-insured rental and leasing companies with under 50,000 motor vehicles. The association resubmitted data, originally provided with a petition for reconsideration of the final rule issued by the agency on January 2, 1987 (52 FR 59), on the fleet size of members of the dealers' association. The agency was asked to consider the data to be representative of all franchised car and truck dealer leasing and rental fleets.

U-Haul International, another motor vehicle rental and leasing company, supported the proposed rule, but requested that the company be removed from Appendix C, stating that because of the unique nature of its business, any data it provided could not be extrapolated to the whole industry. The agency is unable to accommodate this request. U-Haul provided no contradictory data regarding the agency's determinations that, for those companies with combined fleets of more than 50,000 vehicles, the cost of preparing and furnishing such reports is not excessive in relation to the size of the business of the insurer, and that a report from U-Haul would not provide the agency with a representative sampling of the theft experience of rental and leasing companies. Since U-Haul is one of the largest rental and leasing companies of trucks, any information U-Haul provides to the agency is necessary to fulfill the requirements of the Theft Act. The agency further notes that despite this comment, U-Haul submitted timely comments on its theft experience for calendar years 1987 and 1988.

The American Automotive Leasing Association, a trade association representing members that lease motor vehicles on a long-term basis to commercial businesses, supported the thrust of the proposed amendments.

The law firm of Collier, Shannon, Rill & Scott, commenting on behalf of the American Car Rental Association, asserted that: "The cost of car rental franchisors providing theft data on franchisees is excessive in relation to the size of the insurer's business because that information will not significantly contribute to providing the agency with better insight into car theft problems." It was further stated that obtaining this information from franchisees would impose "significant" costs on franchisors. The commenter also disagreed with NHTSA's statement that it would be simple to expand existing franchisee reporting information to franchisors, to include theft information, asserting that:

Franchisors have no contractual right under the

franchise agreement to such information because it is not material to the operation and fulfillment of the agreement. Franchisors do not report information about the franchisee's vehicles because franchisees own their own vehicles. In view of these concerns, the commenter suggested that the reporting obligations of franchisors be limited to reporting the theft experience of company-operated facilities.

The agency is unable to assess this commenter's cost arguments since it did not submit any supporting cost data. Further, even though the commenter suggested that the costs would be significant, there was no suggestion that they would be excessive. As to the suggestion of difficulty under current contractual arrangements in obtaining theft information, the commenter did not argue that the task would be an impossible one. Further, no other commenter indicated any problem in obtaining such information from franchisees.

Accordingly, after taking into consideration the public comments, the agency adopts as final the tentative conclusions formulated in the NPRM, and makes final the language for Part 544 set forth in the NPRM, including Appendix C, which lists the motor vehicle rental and leasing companies (including licensees and franchisees) which are not exempted with respect to calendar year 1988. In the next several months, the agency will issue a proposal setting forth its tentative determination regarding exemptions and listing the companies that would be required to file a report in October 1990 for the 1989 calendar year.

In consideration of the foregoing, 49 CFR Part 544 is amended as follows:

Section 544.3 is revised to read as follows:

§ *544.3 Application.*

This part applies to the motor vehicle insurance policy issuers listed in Appendices A or B, and to the motor vehicle rental and leasing companies listed in Appendix C.

Section 544.6 is amended by revising subparagraph (a)(2):

§ 544.6 *Contents of insurer reports*

(a)(1) * * *

(2) In the case of a motor vehicle rental or leasing company listed in Appendix C, provide the information specified in paragraphs (c), (d)(2)(iv), and (g) of this section for each vehicle type listed in paragraph (b) of this section, for each State in which the company, including any licensee, franchisee, or subsidiary, did business during the reporting period. The information for each listed company shall include all relevant information from any licensee, franchisee, or subsidiary.

A new Appendix C is added to Part 544, to read as follows:

Appendix C—*Motor Vehicle Rental and Leasing Companies Subject to the Reporting Requirements of Part 544*

Alamo Rent-A-Car, Inc.
Automotive Rentals, Inc.
Avis Car Leasing-USA
(Subsidiary of Avis, Inc.)
Avis Rent a Car System, Inc.
(Subsidiary of Avis, Inc.)
Budget Rent A Car Corporation
Dollar Rent-A-Car
(Subsidiary of Systems Inc.)
Enterprise Fleets, Inc.
(Subsidiary of Enterprise Leasing Company)
GE Capital Fleet Services
Hertz Penske Truck Leasing, Inc.
(Subsidiary of Hertz Corporation)
Hertz Rent-A-Car
(Subsidiary of Hertz Corporation)
Lease Plan, USA
Lend Lease
McCullagh Leasing, Inc.
National Car Rental System, Inc.
Peterson, Howell & Heather, Inc.
Rent A Car Company
(Subsidiary of Enterprise Leasing Company)
Rent A Car Corporation
(Subsidiary of American International)
Ryder Truck Rental
(Both rental and leasing operations)
Security Pacific Credit Corporation
U-Haul International, Inc.
(Subsidiary of AMERCO)
United States Fleet Leasing Inc.
(Subsidiary of Hertz Corporation, Leasing)
Wheels, Inc.

Issued on: June 18, 1990

Jeffrey R. Miller
Deputy Administrator
55 F.R. 25606

June 22, 1990

PART 544—INSURER REPORTING REQUIREMENTS

(Docket No. T86-01; Notice 2)

S544.1 Scope.

This part sets forth requirements for insurers to report to the National Highway Traffic Safety Administration information about motor vehicle thefts and recoveries, the effects of the Federal motor vehicle theft prevention standard on those thefts and recoveries, and related insurance practices.

S544.2 Purpose.

The purpose of these reporting requirements is to aid in implementing and evaluating the provisions of the Motor Vehicle Theft Law Enforcement Act to prevent or discourage the theft of motor vehicles, to prevent or discourage the sale or distribution in interstate commerce of used parts removed from stolen motor vehicles, and to help reduce the cost to consumers of comprehensive insurance coverage for motor vehicles.

S544.3 Application.

[This part applies to the motor vehicle insurance policy issuers listed in Appendices A or B, and to the motor vehicle rental and leasing companies listed in Appendix C. **(55 F.R. 25606—June 22, 1990. Effective: July 23, 1990)**]

S544.4 Definitions.

(a) *Statutory terms.* All terms defined in sections 2 and 601 of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 and 2021) are used in accordance with their statutory meanings unless otherwise defined in paragraph (b) of this section.

(b) *Other definitions.* (1) "Comprehensive insurance coverage" means the indemnification of motor vehicle owners by an insurer against losses due to fire, theft, robbery, pilferage, malicious mischief and vandalism, and damage resulting from floods, water, tornadoes, cyclones, or windstorms.

(2) "Gross vehicle weight rating" is used as defined at S571.3 of this chapter.

(3) "Heavy truck" means a truck with a gross vehicle weight rating of more than 10,000 pounds.

(4) "Light truck" means a truck with a gross vehicle weight rating of 10,000 pounds or less.

(5) "Major part" means—

(i) in the case of passenger motor vehicles, any part listed in §S541.5(a)(1) through (14) of this chapter;

(ii) in the case of light trucks, any part listed in §S541.5(a)(1) through (14) of this chapter, or the cargo bed or transfer case;

(iii) in the case of heavy trucks, any part listed in §S541.5(a)(1) through (14) of this chapter, or the cargo bed, drive axle assembly, fifth wheel, sleeper, or the transfer case;

(iv) in the case of multipurpose passenger vehicles, any part listed in §S541.5(a)(1) through (14) of this chapter, or the cargo bed or transfer case; and

(v) in the case of motorcycles, the crankcase, engine, frame, front fork, or transmission.

(6) "Motorcycle" is used as defined at S571.3 of this chapter.

(7) "Motor vehicle" means a passenger motor vehicle, multipurpose passenger vehicle, truck, or motorcycle.

(8) "Multipurpose passenger vehicle" is used as defined at S571.3 of this chapter.

(9) "Recovery" means regaining physical possession of a motor vehicle or a major portion of the superstructure of a motor vehicle with one or more major parts still attached to the superstructure, after that vehicle has been stolen.

(10) "Recovery-in-part" means a recovery in which one or more of the recovered vehicle's major parts is missing at the time of recovery.

(11) "Recovery intact" means a recovery with none of the recovered vehicle's major parts missing at the time of recovery, and with no apparent damage to any part of the motor vehicle other than those parts damaged in order to enter, start, and operate the vehicle, but with additional mileage and ordinary wear and tear.

(12) "Recovery-in-whole" means a recovery with none of the recovered vehicle's major parts missing at the time of recovery, but with apparent damage to some part or parts of the vehicle in addition to those parts damaged in order to enter, start, and operate the vehicle.

(13) "Reporting period" means the calendar year covered by a report submitted under this part.

(14) "Truck" is used as defined at S571.3 of this chapter.

(15)(i) In the case of insurers that issue motor vehicle insurance policies, "vehicle theft" means an actual physical removal of a motor vehicle without the permission of its owner, but does not include the removal of component parts, accessories, or personal belongings from a motor vehicle which is not moved.

(ii) In the case of an insurer which has a fleet of 20 or more vehicles (other than a governmental entity) used primarily for rental or lease and not covered by theft insurance policies issued by insurers of motor vehicles, "vehicle theft" means an actual physical removal of a motor vehicle without the permission of its owner, or keeping possession of the motor vehicle without the permission of its owner for a sufficient period of time so that the vehicle could have been reported as stolen to the State police in the State in which the vehicle was to have been returned. However, vehicle theft does not include the removal of component parts, accessories, or personal belongings from a motor vehicle which is not moved.

S544.5 General requirements for reports.

(a) Each insurer to which this part applies shall submit a report annually not later than October 25, beginning on October 25, 1986. The report shall contain the information required by S544.6 of this part for the calendar year preceding the year in which the report is filed (e.g., the report due by October 25, 1988, shall contain the required information for the 1987 calendar year).

(b) Each report required by this part must:

(1) Have a heading preceding its text that includes the words "Insurer Report";

(2) Identify the insurer, including all subsidiary companies, on whose behalf the report is submitted, and the designated agent, if any, submitting the report or that will submit further documents to complete the report;

(3) Identify the State or States in which the insurer did business during the reporting period;

(4) State the full name and title of the official responsible for preparing the report, and the address of the insurer;

(5) Identify the reporting period covered by the report;

(6) Be written in the English language;

(7) Include a glossary defining all acronyms and terms of art used in the report, unless those acronyms and terms of art are defined immediately after they first appear in the report;

(8) Be submitted in three copies to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; and

(9) If the insurer wishes to submit certain information under a claim of confidentiality, be submitted in accordance with Part 512 of this chapter.

S544.6 Contents of insurer reports.

(a)(1) In the case of insurers that issue motor vehicle insurance policies, provide the information specified in paragraphs (b) through (g) of this section for each State in which the insurer, including any subsidiary, did business during the reporting period if the insurer is listed in Appendix A, or for each State listed after the insurer's name if the insurer is listed in Appendix B.

【(2) In the case of a motor vehicle rental or leasing company listed in Appendix C, provide the information specified in paragraphs (c), (d)(2)(iv), and (g) of this section for each vehicle type listed in paragraph (b) of this section, for each State in which the company, including any licensee, franchisee, or subsidiary, did business during the reporting period. The information for each listed company shall include all relevant information from any licensee, franchisee, or subsidiary. **(55 F.R. 25606—June 22, 1990. Effective: July 23, 1990)】**

(b) For each of the following vehicle types, provide the information specified in paragraphs (c) through (g) of this section for all vehicles of that type insured by the insurer during the reporting period—

(1) Passenger cars.

(2) Multipurpose passenger vehicles.

(3) Light trucks.

(4) Heavy trucks.

(5) Motorcycles.

(c)(1) List the total number of vehicle thefts for vehicles manufactured in the 1983 or subsequent model years, subdivided into model year, model, make, and line, for this type of motor vehicle.

(2) List the total number of recoveries for vehicles manufactured in the 1983 or subsequent model years, subdivided into model year, model, make, and line, for this type of motor vehicle. Beginning with the report due not later than October 25, 1987, for each of these subdivided number of recoveries, indicate how many were:

(i) Recoveries intact;

(ii) Recoveries-in-whole; and

(iii) Recoveries-in-part.

(3) Explain how the theft and recovery data set forth in response to paragraphs (c)(1) and (2) of this section were obtained by the insurer, and the steps taken by the insurer to ensure that these data are accurate and timely.

(4) Explain the use made by the insurer of the information set forth in response to paragraphs (c)(1) and (2) of this section, including the extent to which such information is reported to national, public, and private entities (e.g., the Federal Bureau of Investigation and State and local police). If such reports are made, state the frequency and timing of the reporting.

(d)(1) Provide the rating characteristics used by the insurer to establish the premiums it charges for comprehensive insurance coverage for this type of motor vehicle and the premium penalties for vehicles of this type considered by the insurer as more likely to be stolen. This requirement may be satisfied by furnishing the pertinent sections of the insurer's rate manual(s).

(2) Provide the loss data used by the insurer to establish the premiums it charges for comprehensive insurance coverage for this type of motor vehicle and the premium penalties it charges for vehicles of this type it considers as more likely to be stolen. This requirement may be satisfied by providing the following:

(i) The total number of comprehensive insurance claims paid by the insurer during the reporting period;

(ii)(A) The total number of claims listed in (d)(2)(i) of this section that arose from a theft;

(B) The insurer's best estimate of the percentage of the number listed in paragraph (d)(2)(ii)(A) of this section that arose from vehicle thefts, and an explanation of the basis for the estimate;

(iii) The total amount (in dollars) paid out by the insurer during the reporting period in response to all the comprehensive claims filed by its policyholders;

(iv)(A) In the case of insurers listed in Appendix A or B, provide—

(1) The total amount (in dollars) listed under paragraph (d)(2)(iii) of this section paid out by the insurer as a result of theft; and

(2) The insurer's best estimate of the percentage of the dollar total listed in paragraph (d)(2)(iv)(A)(1) of this section that arose from vehicle thefts, and an explanation of the basis for the estimate;

(B) In the case of other insurers subject to this part, the net losses suffered by the insurer (in dollars) as a result of vehicle theft;

(v)(A) The total amount (in dollars) recovered by the insurer from the sale of recovered vehicles, major parts recovered not attached to the vehicle superstructure, or other recovered parts, after the insurer had made a payment listed under paragraph (d)(2)(iv) of this section;

(B) The insurer's best estimate of the percentage of the dollar total listed in paragraph (d)(2)(v)(A) of this section that arose from vehicle thefts, and an explanation of the basis for the estimate;

(vi) An identification of the vehicles for which the insurer charges comprehensive insurance premium penalties, because the insurer considers such vehicles as more likely to be stolen;

(vii) The total number of comprehensive insurance claims paid by the insurer for each vehicle risk grouping identified in paragraph (d)(2)(vi) of this section during the reporting period, and the total amount (in dollars) paid out by the insurer in response to each of the listed claims totals; and

(viii) The maximum premium adjustments (as a percentage of the basic comprehensive insurance premium) made for each vehicle risk grouping identified in paragraph (d)(2)(vi) of this section during the reporting period, as a result of the insurer's determination that such vehicles are more likely to be stolen.

(3) Identify any other rating rules and plans used by the insurer to establish its comprehensive insurance premiums and premium penalties for motor vehicles it considers as more likely to be stolen, and explain how such rating rules and plans are used to establish the premiums and premium penalties.

(4) Explain the basis for the insurer's comprehensive insurance premiums and the premium penalties charged for motor vehicles it considers as more likely to be stolen. This requirement may be satisfied by providing the pertinent sections of materials filed with State insurance regulatory officials and clearly indicating which information in those sections is being submitted in compliance with this paragraph.

(e) List each action taken by the insurer to reduce the premiums it charges for comprehensive insurance coverage because of a reduction in thefts of this type of motor vehicle. For each action:

(1) State the conditions that must be satisfied to receive such a reduction (e.g., installation of antitheft device, marking of vehicle in accordance with theft prevention standard, etc.);

(2) State the number of the insurer's policyholders and the total number of vehicles insured by the insurer that received this reduction; and

(3) State the difference in average comprehensive insurance premiums for those policyholders that received this reduction versus those policyholders that did not receive the reduction.

(f) In the case of an insurer that offered a reduction in its comprehensive insurance premiums for vehicles equipped with antitheft devices, provide:

(1) The specific criteria used by the insurer to determine whether a vehicle is eligible for the reduction (original equipment antitheft device, passive antitheft device, etc.);

(2) The total number of vehicle thefts for vehicles manufactured in the 1983 or subsequent model years that received a reduction under each listed criterion; and

(3) The total number of recoveries of vehicles manufactured in the 1983 or subsequent model years that received a reduction under each listed criterion. Beginning with the report due not later than October 25, 1987, indicate how many of the total number of recoveries were—

(i) Recoveries intact

(ii) Recoveries-in-whole, and

(iii) Recoveries-in-part.

(g)(1) List each action taken by the insurer to assist in deterring or reducing thefts of motor vehicles. For each action, describe the action and explain why the insurer believed it would be effective in deterring or reducing motor vehicle thefts.

(2)(i) State the insurer's policy regarding the use of used parts to effect repairs paid for by the insurer on vehicles it insures. Indicate whether the insurer required, promoted, allowed, or forbade the use of used parts in those repairs.

(ii) In the case of insurers requiring, promoting, or allowing the use of used parts to make repairs paid for by the insurer on vehicles it insures indicate the precautions taken by or on behalf of the insurer to identify the origin of those used parts.

S544.7 Incorporation by reference.

(a) In any report required by this part, an insurer may incorporate by reference any document or portion thereof previously filed with any Federal or State agency or department within the past 4 years.

(b) An insurer that incorporates by reference a document not previously submitted to the National Highway Traffic Safety Administration shall append that document or the pertinent sections of that document to its report, and clearly indicate on the cover or first page of the document or pertinent section the regulatory requirement in response to which the document is being submitted.

(c) An insurer that incorporates by reference a document shall clearly identify the document and the specific portions thereof sought to be incorporated, and, in the case of a document previously submitted to the National Highway Traffic Safety Administration, indicate the date on which the document was submitted to the Agency and the person whose signature appeared on the document.

52 F.R. 59
January 2, 1987

Appendix A

Issuers of Motor Vehicle Insurance Policies Subject to the Reporting Requirements in Each State in Which They do Business

[Aetna Life and Casualty Group
Allstate Insurance Group
American Family Group
American International Group
California State Auto Association
CIGNA Group
CNA Insurance Group
Continental Group
Crum & Foster Companies
Farmers Insurance Group
Fireman's Fund Group
GEICO Corporation Group
Hartford Insurance Group
Liberty Mutual Group
Nationwide Group
Progressive Group
State Farm Group
Travelers Insurance Group
United States F&G Group
USAA Group]

(53 F.R. 35073—September 9, 1988. Effective: October 11, 1988)

Appendix B

Issuers of Motor Vehicle Insurance Policies Subject to the Reporting Requirements in Each State in Which They do Business

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[Alfa Insurance Group (Alabama)]
Amica Mutual Insurance Company (Rhode Island)
Auto Club of Michigan Group (Michigan)
Commercial Union Assurance Group (Maine)
[Concord Group Insurance Company (Vermont)]
Island Insurance Group (Hawaii)
Kentucky Farm Bureau Group (Kentucky)
Southern Farm Bureau Group (Mississippi)

(54 F.R. 46252—November 2, 1989. Effective: December 4, 1989)

[Appendix C

Motor Vehicle Rental and Leasing Companies Subject to the Reporting Requirements of Part 544

[Alamo Rent-A-Car, Inc.

Automotive Rentals, Inc.

Avis Car Leasing-USA
(Subsidiary of Avis, Inc.)

Avis Rent A Car System, Inc.
(Subsidiary of Avis, Inc.)

Budget Rent A Car Corporation

Dollar Rent-A-Car
(Subsidiary of Systems Inc.)

Enterprise Fleets, Inc.
(Subsidiary of Enterprise Leasing Company)

GE Capital Fleet Services

Hertz Penske Truck Leasing, Inc.
(Subsidiary of Hertz Corporation)

Hertz Rent-A-Car
(Subsidiary of Hertz Corporation)

Lease Plan, USA

Lend Lease

McCullagh Leasing, Inc.

National Car Rental System, Inc.

Peterson, Howell & Heather, Inc.

Rent A Car Company
(Subsidiary of Enterprise Leasing Company)

Rent A Car Corporation
(Subsidiary of American International)

Ryder Truck Rental
(Both rental and leasing operations)

Security Pacific Credit Corporation

U-Haul International, Inc.
(Subsidiary of AMERCO)

United States Fleet Leasing Inc.
(Subsidiary of Hertz Corporation, Leasing)

Wheels, Inc.

(55 F.R. 25606—June 22, 1990. Effective: July 23, 1990)]

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 110

Tire Selection and Rims
(Docket No. 87-12; Notice 3)
RIN 2127-AC18

ACTION: Final Rule.

SUMMARY: This notice amends Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars,* to permit new passenger cars, multipurpose passenger vehicles, and light trucks equipped with passenger car tires to be equipped with a non-pneumatic spare tire. These standards had required all new vehicles to be equipped with pneumatic tires. The notice also establishes requirements requiring non-pneumatic tires to bear a label stating that the tires are to be used only as a temporary spare tire and only at limited speeds. It requires the manufacturer to place a placard in the vehicle and information in the owner's manual explaining the proper use of these tires. In addition, the notice establishes Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* which includes definitions relevant to non-pneumatic tires and specifies performance, testing, and additional labeling requirements for these tires. In particular, the new standard contains performance requirements related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. The agency has determined that these requirements provide the basic tests to ensure the structural integrity of non-pneumatic tires. To ensure an even higher degree of safety, a non-pneumatic tire must be labeled for use only as a temporary spare tire at limited speeds. NHTSA believes that these performance requirements together with these labels ensure the safety of non-pneumatic tires.

EFFECTIVE DATE: The rule is effective on August 20, 1990.

SUPPLEMENTARY INFORMATION:

I. *General Information*

Federal Motor Vehicle Safety Standard No. 110, *Tire Selection and Rims,* (49 CFR §571.110) specifies requirements for the selection of tires to be used on passenger cars. Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars,* (49 CFR §571.120) specifies similar requirements for the selection of tires to be used on vehicles other than passenger cars. The purpose of these standards is to prevent tire overloading and to facilitate the proper matching of a tire and rim to a vehicle. They also require a vehicle manufacturer to place in each new vehicle a placard bearing information to ensure use at the proper inflation.

Section S4.1 of Standard No. 110 requires passenger cars to be equipped with tires that meet the requirements of §571.109, "New Pneumatic Tires—Passenger Cars." (49 CFR §571.109). Section S5.1.1 of Standard No. 120 similarly requires vehicles other than passenger cars to be equipped with pneumatic tires that meet the requirements of Standard No. 109 or Standard No. 119 "New Pneumatic Tires for Vehicles Other Than Passenger Cars." (49 CFR §571.119).

Standard No. 109 expressly applies only to new pneumatic tires which it defines as "mechanical device(s) . . . (that) contain the *gas* or fluid that sustains the load." (emphasis added). The standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength (in vertical loading), tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

The practical effect of Standard No. 109's applicability to only pneumatic tires, together with Standard No. 110's requirement that passenger cars must be equipped with tires that meet Standard No. 109's requirements, is to prohibit any new passenger car from being equipped with non-pneumatic tires. Similarly, Standard Nos. 109, 119, and 120 together prohibit any vehicle subject to Standard No. 120 from being equipped with non-pneumatic tires.

A non-pneumatic tire is a mechanical device which serves the same function as a pneumatic tire. That is, it transmits the vertical load and tractive forces from the roadway to the vehicle and generates the tractive forces that provide the directional con-

trol of the vehicle. However, the non-pneumatic tire differs from the pneumatic tire in that the former does not rely on air pressure or the containment of any gas or fluid for providing those functions. A non-pneumatic tire may be designed in many different ways. For instance, it may be solid rubber to which tread is attached; it may be part of an assembly in which the wheel is attached to the tire and tread; or it may contain the tread, tire, rim, and wheel. Further, many different materials may be used in constructing the tire assembly. Because non-pneumatic tires present an emerging technology, it is likely that tire manufacturers may develop new designs and use materials that are currently not known or contemplated.

In view of Standard No. 109's and Standard No. 110's prohibition of tires other than pneumatic tires on motor vehicles, General Motors (GM) petitioned the agency to amend Standard No. 109 to allow non-pneumatic spare tire assemblies for temporary use on passenger cars. The petitioner suggested performance requirements and test conditions for non-pneumatic tires that would address characteristics such as the endurance, high speed performance, strength (in vertical loading), and lateral strength of the non-pneumatic tire. In large part, GM used the existing requirements in Standard No. 109 as a guide for selecting the performance requirements and test conditions for the requested amendment. It changed the requirement and test related to the bead unseating resistance, which specifically relates to pneumatic tires, and also changed the test procedure and strength requirements for the tire's ability to withstand concentrated vertical loads. In addition, GM suggested certain labeling requirements including a warning that the tires would be for temporary use.

GM submitted its petition in connection with its work with Uniroyal Goodrich Co. (Uniroyal) to develop a spare non-pneumatic tire which it intends for only temporary use. The petitioner believes that the agency's adoption of its requested amendment would reduce the weight and size of the spare tires used in passenger cars, resulting in reduced costs, improved reliability and servicability, and minor improvements in fuel economy. Because a non-pneumatic tire is not dependent on air pressure, it would not be subject to problems associated with low inflation pressure such as a blow out or bead unseating during hard cornering.

On September 23, 1987, NHTSA issued a notice announcing the grant of GM's petition and requesting comments about non-pneumatic tires (52 FR 35740). The notice invited comment about what requirements would be necessary to ensure the safe use of a non-pneumatic tire. In response to that notice, NHTSA received comments from various motor vehicle and tire manufacturers as well as the Rubber Manufacturers Association. NHTSA considered each of these comments in developing a notice of proposed rulemaking (NPRM) which it published on April 7, 1989 (54 FR 14109).

II. *Notice of Proposed Rulemaking*

In the NPRM, NHTSA proposed to amend Standard No. 110 to permit the use of non-pneumatic tires on passenger cars, but only as a temporary spare and to establish a new standard for non-pneumatic tires. The notice requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109. As a general proposition, the NPRM explained that in developing the new safety standard, the agency desired to formulate a generic one that would be applicable to as many potential designs of non-pneumatic tires as possible rather than one that was based on a specific design, which might inadvertently restrict future developments and skew innovations toward the initial design.

More specifically, the notice proposed three amendments to Standard No. 110. First, it proposed that section S4.1 be amended to allow passenger cars to be equipped with a non-pneumatic spare tire. Second, the notice proposed that Standard No. 110 contain additional labeling requirements and vehicle placarding requirements explaining that such tires should be used only as a spare tire on a temporary basis at speeds not to exceed 50 mph. Third, the notice proposed that safety information about the use of a non-pneumatic tire be included in the owner's manual of the passenger car.

The proposed new safety standard was Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars.* According to the proposal, the new standard, which was patterned after Standard No. 109, would include definitions relevant to non-pneumatic tires and specify performance requirements, testing procedures, and labeling requirements for these tires. To regulate performance, the new standard would contain performance requirements and tests related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. While the agency considered proposing requirements related to additional factors such as handling and braking, it tentatively determined that the proposed requirements would adequately ensure motor vehicle safety by providing the basic tests necessary to ensure the structural integrity and durability of non-pneumatic tires.

The NPRM also proposed to supplement the labeling requirements in Standard No. 110 by including in Standard No. 129 labeling requirements similar

to those set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and the tire identification number. The notice proposed to allow methods of marking other than "molding," provided the marking was permanent because the agency tentatively concluded that it might be difficult to mold the required information on some types of anticipated non-pneumatic tire designs. The agency also tentatively concluded that the temporary use and maximum speed labeling requirements would provide an extra margin of safety related to handling and braking. In addition, the agency noted that compact pneumatic T-type tires that are currently used as temporary spare tires have been shown to be safe, even though they are not subject to performance requirements beyond those applicable to full size tires in Standard No. 109. The agency believed that in some respects this comparison was relevant since, like the compact T-type pneumatic tires, the non-pneumatic tires allowed by these amendments would be limited to use as temporary spare tires.

The agency tentatively concluded that the proposed performance requirements, together with the proposed labeling requirements, would remove a restriction in the existing standards on technological innovation while still ensuring that the new non-pneumatic tires met the need for safety.

III. *The Comments and the Agency Response*

NHTSA received 13 comments in response to the NPRM. In general, all commenters supported the proposal to permit a vehicle to be equipped with a non-pneumatic spare tire. The agency has considered the points in the comments in developing this final rule. The commenters' significant points are addressed below, along with the agency's response to the comments. For the convenience of the reader, this notice follows the regulatory text's order.

A. *Proposal to Amend Standard No. 110*

Definitions

The NPRM proposed to add definitions to paragraph S3 for "non-pneumatic spare tire assembly," "non-pneumatic tire," "non-pneumatic tire assembly," "rim," and "wheel center member." The agency intended these definitions to be general in order to better ensure a generic standard appropriate to any type of non-pneumatic tire. These definitions were patterned after analogous definitions in NHTSA's safety standard for pneumatic tires and SAE Recommended Practice J328a, "Wheels—Passenger Cars—Performance Requirements and Test Procedures."

The agency received two comments about the proposed definitions. Michelin requested that the definition of a "non-pneumatic spare tire assembly", which was defined as a device "intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car . . .", be revised to state that the NPSTA be "in support of" as well as "in place of." According to the commenter, this modification would allow future NPSTAs to be fitted on tire and wheel assemblies without removing the deflated pneumatic tire. The agency has decided not to adopt Michelin's suggestion which is beyond the scope of the current proposal and its test procedures. Further, the agency needs more information about devices used "in support of" a deflated pneumatic tire, especially about the procedures for testing them while they are mounted on a deflated pneumatic tire. Therefore, NHTSA has decided not to expand the definition as requested by Michelin.

Uniroyal suggested that the agency move the definition of "rim" from the definition section (S3) to the requirements section (S4.4). The agency has decided not to adopt this suggestion which is unnecessary and contrary to standard regulatory drafting. The agency notes that it is modifying the definition of "rim" to "non-pneumatic rim" and "test rim" to "non-pneumatic test rim." This change will help to distinguish between conventional rims for pneumatic tires and rims for non-pneumatic tires. The notice adopts this distinction throughout Standards 110, 120, and 129.

Labeling Requirements

The NPRM proposed labeling requirements for non-pneumatic spare tires and tire assemblies in section S6 of Standard No. 110. The proposal specified that the information had to be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" and not be smaller than a given size. The proposal explained that it was proposing to allow different methods of permanent marking in addition to molding, the labeling method required in Standard No. 109, because it might be difficult to mold the required information into or onto some non-pneumatic tire and assembly designs. It also proposed that the labeling on each non-pneumatic spare tire would state "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation(s) of the pneumatic tire(s) that the non-pneumatic tire was intended to replace. This notice will respond separately to each of the commenters concerns.

Uniroyal requested the agency to modify the requirement that non-pneumatic spare tires be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" to allow a permanently affixed label to contain the required information. It specifically stated that paper or plastic labels should be allowed as an alternative

technique to comply with S6. NHTSA notes that the key criteria related to informational marking requirements is that the message be useful and understandable for the lifetime of the tire. Thus, a message must be permanent, legible, and conspicuous. After reviewing Uniroyal's request, the agency believes that affixing a permanent label on a non-pneumatic tire would not meet these ends. The agency is concerned that a paper label would not be permanent given that it would be exposed to environmental factors such as rain, snow, road salt, car wash brushes and detergents. The agency is especially concerned that there is nothing to prevent a paper label from disintegrating when exposed to the elements or being rubbed off by a curb. Similarly, there is nothing to prevent the printing on the label from becoming illegible. The agency therefore has decided not to permit a label as an alternative technique to comply with S6.

Section S6(a) contained a proposal that each non-pneumatic spare tire be labeled "FOR TEMPORARY USE ONLY." The NPRM explained that this mandatory warning would be in the interest of motor vehicle safety by encouraging the limited use of non-pneumatic tires as a replacement for T-type temporary spare tires. The agency further believed such labeling would provide consumers with valuable guidance about this new type of tire. All commenters mentioning the proposal to require temporary use labeling agreed that it had merit given the current level of technology and agreed that the extended use of a non-pneumatic tire would be inappropriate.

Section S6(b) contained a proposal that each non-pneumatic spare tire be labeled "MAXIMUM 50 M.P.H." The NPRM stated that this maximum speed warning, like the temporary use warning, would be in the interest of safety. The notice further explained that the Economic Commission for Europe (ECE) Regulation 64 contains a maximum speed warning of 80 kilometers per hour (49.7 m.p.h.) in response to concerns over the potential for some degradations in the braking and handling performance of a vehicle fitted with a temporary spare tire. The notice continued that even though these concerns did not directly relate to a tire's structural failure, the agency believed that a maximum speed warning would improve the total safety of the vehicle because any potential problems associated with handling, control, stability, and braking are typically exacerbated at faster speeds. It also stated that a maximum speed warning would serve to deter some motorists from driving with a non-pneumatic tire on an extended basis.

NHTSA received four comments on the proposal to require a maximum speed warning of 50 m.p.h. While Goodyear and Firestone supported the proposal, Uniroyal and General Motors opposed it, stating that it should be at the discretion of the vehicle manufacturer, the entity responsible for the vehicle's braking, handling, and other performance characteristics. Uniroyal stated that such a requirement is unnecessary since T-type pneumatic spares are not required to have such labeling. It also commented that the maximum speed labeling in ECE Regulation 64 is inapplicable to the non-pneumatic spare, since the non-pneumatic tire would be subject to more stringent performance requirements. GM commented that a maximum speed labeling requirement was not warranted, stating that "there is no generic technical or safety reason for it," a non-pneumatic spare tire is not different from current temporary compact spare tires, the maximum recommended speed of 50 m.p.h. might unduly alarm some drivers, and consumers might misinterpret the "50 *m.p.h.* speed" label as a "50 *mile* use" restriction.

After reviewing the maximum speed labeling requirement in light of these comments, NHTSA continues to believe that such a requirement would be in the interest of safety. The agency notes that according to information provided by Uniroyal, there are some differences in performance characteristics between non-pneumatic spare tires and pneumatic spares. For instance, the non-pneumatic tire tends to "nibble," i.e., generate lateral forces when crossing a longitudinal road irregularity. While differences with conventional pneumatic spare tires are not significant enough to justify a prohibition of non-pneumatic tires, these relative shortcomings, which might alarm a driver unfamiliar with them, appear to be exacerbated at greater speeds. Until more experience is gained with non-pneumatic tires, the agency believes that GM's claim that there is no safety reason to justify maximum speed labeling is premature. The agency notes that GM included a 50 m.p.h. maximum speed marking on its pneumatic temporary spare tire for the first five years after its introduction, suggesting that a newly introduced temporary tire design should contain such a maximum speed warning. Based on the above considerations, the agency concludes that to satisfy the Vehicle Safety Act's mandate, the 50 m.p.h. maximum speed marking must be a mandatory requirement and not be left to the manufacturers' discretion.

Section S6(c) of Standard No. 110 contained a proposal that the non-pneumatic tire be labeled with the "size designation(s) of the pneumatic tires that this non-pneumatic tire spare assembly is intended to replace or, at the manufacturer's option, capable of replacing." All those who commented on this provision opposed it, stating that the requirement could result in lengthy information that might confuse consumers. For instance, a consumer might mistakenly conclude that a 15 inch non-pneumatic

tire could replace any 15 inch pneumatic tire. They claimed that this incorrect assumption could be dangerous given the potential for many vehicle specific non-pneumatic tire and tire assembly designs. In place of this proposal, Uniroyal, Firestone, and GM suggested that the tires be labeled with a vehicle manufacturer's part number, with GM recommending a "non-pneumatic spare tire identifying code" (e.g., "ABC") as an alternative. The State of Connecticut recommended that the non-pneumatic spare tire be labeled to indicate specifically the vehicle(s) on which it is intended to be used. In contrast, Goodyear and Uniroyal criticized requiring vehicle specific marking, stating that the labeling on a tire with multiple vehicle applications could be lengthy, confusing, and thus possibly dangerous.

After reviewing these comments, NHTSA has determined that instead of designations of the pneumatic tires replaced, a "non-pneumatic tire identifying code (NPTIC)" should be required to identify a non-pneumatic tire. Like the tire size designation of a pneumatic tire, the NPTIC's purpose is to provide consumers information about the proper application of a non-pneumatic tire. The agency believes that this method of identification is superior to requiring a non-pneumatic tire to be labeled with the pneumatic tire size or the non-pneumatic spare tire's specific vehicle application(s) given the potential for many different non-pneumatic tire designs. A manufacturer may still mark specific vehicle application(s) on the tire provided that the additional information did not obscure or confuse the required information. Manufacturers are urged, therefore, to avoid unnecessarily long vehicle application information or unnecessarily long identifying codes. Based on the above considerations, the manufacturer will be required to label a non-pneumatic spare tire or spare tire assembly with a NPTIC, which is defined in section S3 of Standard 129. A manufacturer also is required to place the NPTIC on the vehicle placard and in the owner's manual. In addition, the NPTIC will replace any reference in the regulatory text to the "non-pneumatic tire size designation."

Vehicle Placarding

Section S7 of the Standard No. 110 contained proposed requirements for vehicle placards. Under the proposal, the placard would state, in letters not less than 1.0 inch high, "CAUTION—USE AS SPARE TIRE," and in letters not less than 0.5 inches high, "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation of the pneumatic tire to be replaced. The agency believed that this information would help explain that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time.

Volkswagen commented that the size of the lettering proposed in S7.1 would result in a placard that was too large to easily fit in the trunk. Thus, it requested that the standard require the words to be "legible and conspicuous," or in the alternative, to change the 1.0 inch requirement to ⅜ inch and the ½ inch requirement to ¼ inch. NHTSA rejects the first suggestion because the Vehicle Safety Act requires its requirements to be stated in objective terms. However, it has decided to adopt the requested size reductions which the agency believes will be less intrusive but still conspicuous.

GM and Uniroyal opposed the vehicle placarding requirements as being unnecessary and costly. GM based its opposition to these requirements on its earlier arguments against the labeling requirements. NHTSA believes that the placarding requirements are necessary for the reasons provided in support of the labeling requirements in S6. The agency also disagrees that placarding would be unreasonably costly, especially since most vehicle trunks currently contain a placard explaining the use of jacks and spare tires. The information required by this provision could be easily added to that placard. Even for a vehicle without such a placard, the cost of adding a placard would be minimal.

Uniroyal claimed that the words "Danger" and "Caution" might unduly alarm consumers. NHTSA notes that the placard's purpose is to ensure that a person installing a non-pneumatic spare tire on a vehicle is made aware of its proper use and that it should be used only as a spare tire, even if he or she fails to notice the labeling on the tire itself. Because the word "caution" is not essential to this purpose and some consumers might be unduly alarmed by this word, the agency is modifying the placard to state "IMPORTANT—USE OF SPARE TIRE" rather than "CAUTION—USE OF SPARE TIRE."

Supplementary Information

Section S7.2 of Standard No. 110 proposed that the owner's manual of a passenger car equipped with a non-pneumatic spare tire contain information explaining its proper use. This information, which was patterned after ECE Regulation 64, included instructions that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time, that the driver should drive with caution when using a non-pneumatic tire, that he or she should replace it with a pneumatic tire and rim as soon as possible, and that a vehicle should not be operated with more than one non-pneumatic tire at one time.

Uniroyal and GM objected to the proposal to require an owner's manual to contain information

about a non-pneumatic tire's use. Uniroyal restated its view that non-pneumatic tires should not be singled out for informational requirements with which pneumatic spare tires are not required to comply. GM stated that requiring warnings on the tire, on a placard, and in the owner's manual was a "costly redundancy" that would discourage the use of such tires.

NHTSA continues to believe that the requirements in S7.2 provide valuable safety information about non-pneumatic tires, a new type of tire design with which consumers will be less familiar than temporary pneumatic tires. As for GM's criticism that this requirement would result in a "costly redundancy," the agency believes that requiring the safety information to appear in each of the proposed locations provides a safety benefit. It is reasonable to label the tire since a motorist must handle the tire itself before installing it on the vehicle. It is also reasonable to require the information on a placard in the trunk near where the spare tire is stored, because a motorist may not notice the information on the tire, especially at night or during inclement weather. Similarly, it is reasonable to supplement these brief messages with more detailed information in the owner's manual, since a motorist typically consults his or her owner's manual when seeking detailed information about vehicle usage.

In response to GM's concern that these warnings might discourage motorists from using non-pneumatic tires, the agency has modified some of the wording. As with the placard's wording, the agency has substituted the word "IMPORTANT" for "CAUTION" to make the label less threatening. It has also changed S7.2(b) to state "An instruction to drive carefully when the non-pneumatic tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity." The agency believes that this wording will continue to convey guidance concerning the proper use of non-pneumatic tires while helping to avoid arousing "undue concern."

B. *Standard No. 129*

Application

The agency proposed in section S2 of Standard No. 129 that the new standard apply to "new temporary spare non-pneumatic tires for use on passenger cars." In other words, the proposal, in conjunction with the proposed amendment to Standard No. 110, would permit a non-pneumatic tire to be used as a spare tire on passenger cars. The NPRM explained that the petitioner only sought to allow non-pneumatic tires as a replacement for T-type pneumatic temporary tires on passenger cars. It further noted that 95 percent of T-type tires were used on passenger cars with the remaining 5 percent on light trucks. The agency requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109.

No commenter supported limiting the use of non-pneumatic tires to passenger cars. Instead, Chrysler, Goodyear, Uniroyal, RMA, Firestone, and GM commented that the agency should extend the applicability of Standard No. 129 to permit use of non-pneumatic spare tires on light trucks and similar vehicles that use passenger car temporary tires. For instance, Uniroyal stated that the agency should not restrict the non-pneumatic spare tire to passenger cars given that many new light trucks and vans are equipped with passenger car tires.

NHTSA agrees with the comments and has decided to permit the use of a non-pneumatic spare tire on any vehicle that is equipped with passenger car tires. Accordingly, the agency is revising section S5.1.1 to permit the use of a non-pneumatic temporary spare tire assembly on vehicles subject to Standard No. 120 such as light trucks provided that the vehicle is equipped with passenger car tires. In addition, amendments, like those to Standard No. 110, are made to Standard No. 120 to include new informational requirements for tire labeling, vehicle placarding, and the owner's manual.

Definitions

Commenters made suggestions to modify certain proposed definitions. Firestone recommended that the portion of the definition for "non-pneumatic tire" stating that the tire "does not rely on the containment of any gas or fluid" be changed to state that the tire "does not *primarily*" rely on such containment (emphasis added). NHTSA has decided to reject Firestone's suggestion and adopt the definition as proposed because the suggested change would inject uncertainty about whether a tire should be classified as pneumatic or non-pneumatic. For instance, it might be ambiguous whether a pneumatic tire with "run-flat" capability is a non-pneumatic tire under Firestone's suggested definition.

Goodyear, Uniroyal, and RMA suggested that the definition for "tread" be changed by deleting reference to the tread's being "intended to wear away during normal use of the tire." NHTSA agrees with this suggestion which will make the definition for "tread" in Standard No. 129 consistent with the one in Standard No. 109.

Uniroyal suggested that the definition for "maximum tire width," should be changed so that it uses the phrase "exterior edges" in place of "outer and inner surfaces" which appears in reference to

"carcass" and "tread." The agency has decided to adopt the suggested wording which it believes provides a more generic and thus more appropriate definition.

The agency is introducing a definition for "non-pneumatic tire identification code (NPTIC)" in response to comments that a non-pneumatic tire should not be labeled with the size of the pneumatic tire it is intended to replace, but should be labeled with other identifying information. In the section above about labeling requirements, the notice explains that the agency agrees with the commenters that the NPTIC would be in the interests of safety. The reader should refer to that section for a more extensive discussion of this issue.

As discussed earlier, the terms "rim" and "test rim" have been changed to "non-pneumatic rim" and "non-pneumatic test rim." This will help distinguish between rims used with pneumatic tires and those used with non-pneumatic tires. Corresponding changes have been made throughout the regulatory text.

Performance Requirements and Testing Procedures in Standard No. 129

General Considerations

The NPRM proposed certain performance requirements and testing procedures for non-pneumatic tires. In developing a proposed standard for non-pneumatic tires, the agency reviewed the petition, the docket comments responding to the agency's request for comments, and the purpose for and mechanics of the requirements and tests for pneumatic tires in Standard No. 109. As a result of this analysis, the agency proposed the following requirements which it believed would ensure the safety of non-pneumatic tires. These included a lateral strength requirement instead of Standard No. 109's bead unseating requirement; and requirements for strength (in vertical loading), tire endurance, and high speed performance with modifications to take into account a non-pneumatic tire's lack of air pressure. The agency also proposed requirements related to the non-pneumatic tire assembly's size and construction, load rating, and a tread wear indicator. NHTSA tentatively concluded that the lateral strength, strength (in vertical loading), endurance, and high speed requirements would assure the structural integrity and durability of a non-pneumatic tire. The agency further believed that these performance requirements together with the proposed labeling requirements explaining that a non-pneumatic tire should be used only as a temporary spare tire and at limited speeds would assure their safety. Therefore, it decided not to propose additional tests beyond those equivalent to the ones in Standard No. 109. The agency's consideration of comments addressing these factors will be discussed separately.

Lateral Strength Performance Requirements

Section S4.2.2.3 of Standard No. 129 proposed requirements related to the lateral strength of a non-pneumatic tire. Such a tire would be required to show no visual evidence of tread or carcass separation, cracking, or chunking at forces comparable to those specified in Standard No. 109's bead unseating test for compact temporary pneumatic tires. The agency explained that the bead unseating test is intended, in part, to evaluate the loss of air of a tubeless pneumatic tire. In that regard, it would not be helpful in evaluating the lateral strength of a non-pneumatic tire. Nevertheless, because the bead unseating test also evaluates a pneumatic tire's resistance to lateral forces, the agency believed that a comparable test for non-pneumatic tires would be beneficial in determining their structural integrity.

The NPRM explained that GM, in its petition, recommended adopting the same test device used in the bead unseating test of pneumatic tires in Standard No. 109. The agency rejected this recommended test fixture because the unseating "blocks" might be inappropriate for other non-pneumatic tire designs and thus would be too specific to be included in a generic standard. Instead, the agency proposed a lateral strength test device that it believed was generic and appropriate for any anticipated non-pneumatic tire design. The proposed test block was patterned after a standard barrier type curb defined by the American Association of State Highway and Transportation Officials (AASHTO) in its publication, "A Policy on Geometric Design of Highways and Streets—1984." The proposed test was intended to evaluate the strength of a non-pneumatic tire in response to loads that would result from contact with a curb or similar road feature. The agency sought comments concerning the design of the proposed test device, test procedure, and performance requirements intended to evaluate the lateral strength of non-pneumatic tires.

Goodyear requested that the non-pneumatic tires not be subject to a lateral strength test, claiming that such a test was unnecessary and inappropriate. It also claimed that the intent of Standard No. 109's bead unseating test is solely "air retention," as evidenced by its application to tubeless but not tubed pneumatic tires.

NHTSA disagrees with Goodyear's comments and believes that the lateral strength requirement will effectively measure a non-pneumatic tire's resistance to lateral loads. The agency believes that this test will also help evaluate the possibility of the tire's separation from the rim or wheel center mem-

ber or the tire's "cracking," "chunking," or similar damage. The agency notes that the reason that Standard No. 109's bead unseating test is applied to tubeless tires only is because that failure mode is unique to tubeless pneumatic tires. Thus, its application to tubed pneumatic tires would be unnecessary and inappropriate.

Uniroyal, RMA, and Firestone each recommended that the lateral test force block be made lighter and smaller to make testing easier and safer. The lateral force test block shown in Figure 2 and referenced in S5.2, would have weighed 120 pounds and have been 6.5 inches in height, 14 inches in depth, and 18 inches in width. Uniroyal commented that the block's depth could be reduced by 7 inches which would reduce the block's weight by over 50 percent. Firestone stated that the width should be retained to ensure that the test block would envelop the side wall of each tire.

After reviewing these comments, NHTSA believes that the test block size can be reduced to facilitate testing without adversely affecting the test procedure's effectiveness. In particular, the agency is adopting Uniroyal's recommendation to reduce the depth by 7 inches by removing 3½ inches from each end of the block and to reduce the height by removing one inch from the bottom of the block. After reviewing Firestone's concerns about the block's "envelopment" of a non-pneumatic spare tire, the agency concludes that it is necessary to widen the test block to 23 inches. The agency calculates that these changes will reduce the test block's weight to approximately 55 pounds, a 53 percent reduction.

Section S5.2 of the NPRM also proposed test requirements related to a non-pneumatic tire's lateral strength. Section S5.2.2.1 specified distances between the test block and the tire being tested. Uniroyal recommended that the agency add another distance expressed as "B = A − 1," explaining that without this modification certain tires would not pass the proposed requirement due to immediate contact with the wheel rim or other member. Thus, in anticipation of future non-pneumatic tire designs with a section height of less than 2 inches above the wheel rim or center member, the agency is including the additional distance requested by Uniroyal.

Vertical Strength Requirements

NHTSA proposed a strength test in S5.3 of Standard No. 129 that was intended to measure the tire's ability to resist concentrated vertical loads. The proposed test would have required a cylindrical steel plunger to be forced into the non-pneumatic tire at a rate of two inches per minute. The tester would then have evaluated the breaking energy for each test point in terms of inch pounds.

In the NPRM, the agency considered also proposing a "cleat" test, like the one suggested in GM's petition, which would have required a non-pneumatic tire to withstand a load exerted by a "cleat." This "cleat" would be ½ inch thick with the edge, that is forced against the tread of the non-pneumatic tire, rounded with ¼ inch radius, and the "cleat" would be one inch wider than the non-pneumatic tire's tread width. The agency tentatively rejected the cleat device because it believed that the plunger test would better simulate real world hazards and because the petitioner did not provide sufficient documentation in support of its test device. The agency expressly requested comments on both the plunger test and the cleat test.

Goodyear provided extensive comments in opposition to any vertical strength test requirement. It argued that the main concern addressed by the "tire strength" requirement in Standard No. 109 is puncture resistance (i.e., the integrity of the air chamber in resistance to vertical forces exerted by nails and similar penetrating objects). It believed that such a concern was not applicable to a non-pneumatic tire. Alternatively, Goodyear stated that if a strength test were deemed necessary, then GM's cleat test would be more appropriate because it evaluates a non-pneumatic tire's capability to withstand loading from curbs, potholes, or railroad tracks. While Uniroyal, RMA, Firestone, and GM also stated that the cleat test would be superior to a plunger test, no commenter supported the plunger test.

NHTSA continues to believe that a vertical strength test is necessary to evaluate a non-pneumatic tire's structural integrity. However, after reevaluating the proposal in light of the comments, the agency agrees that a cleat test, similar to the one requested in GM's petition, would better evaluate the real world problems that will most likely cause a non-pneumatic tire to experience a structural failure.

The agency notes that the plunger test used in Standard No. 109 is well suited for evaluating the energy absorbing capability and structural integrity of a pneumatic tire under conditions of maximum deformation. The plunger pushing against the center of the pneumatic tire's tread will deflect the tire to the maximum extent possible before forcing the tire against the rim. However, the cleat test would be inapplicable for a pneumatic tire which would experience a "pneumatic" failure when the tire's sidewall would be pinched against the rim flanges, long before the energy absorbing capability or structural integrity of the tire could be tested adequately.

In contrast, the situation is reversed for non-pneumatic tires. The "concentrated" type of load used in the plunger test could lead to a "puncture" (i.e., penetration by the plunger) of a non-pneumatic tire, but would not lead to a "pneumatic" failure. For

instance, Uniroyal, stated that its non-pneumatic tire continued to perform without any problems after it was "punctured" by several nails. The agency further notes that there is nothing inherent in a non-pneumatic tire's design that would be expected to lead to failure as the result of a particular type of impact. Based on these considerations, the agency believes that a cleat test that places stress on the entire cross section of a non-pneumatic tire appears to better address real world hazards to which such tires would be vulnerable than would a plunger type test.

As for the measurement of a non-pneumatic tire's strength, NHTSA believes that such a tire should be capable of absorbing energy at a level comparable to the pneumatic temporary tires that it is intended to replace. The NPRM proposed in S4.2.2.4 that the appropriate minimum breaking energy would be 1,950 inch pounds for tires with load ratings below 880 pounds and 2,600 inch pounds for tires with load ratings 880 pounds or above.

Uniroyal recommended that S4.2.2.4 be amended so that the minimum breaking energy would be 525 inch pounds for tires with load ratings below 880 pounds and 700 inch pounds for load ratings of 880 pounds or above. After reviewing Uniroyal's extensive comments in support of the reduced energy levels, NHTSA still believes that the proposed levels are appropriate to ensure a non-pneumatic tire's ability to withstand road hazards. The agency notes that the proposed energy levels are more comparable to the energy levels that a pneumatic temporary spare tire is required to withstand. Given the agency's belief that it is appropriate to require the non-pneumatic tires to be capable of absorbing energy at a level comparable to the pneumatic temporary spare tires that they are intended to replace, the agency has decided to adopt the energy levels as proposed rather than to adopt Uniroyal's suggested energy levels. The agency's review of Uniroyal's data further indicates that the higher energy levels will better protect against real world hazards.

After reviewing S4.2.2.4, NHTSA has decided to modify its language related to a non-pneumatic tire's failure. As proposed, this section stated "Each tire shall meet the requirements for minimum breaking energy when tested in accordance with S5.3 to the strength requirements . . . ." Because a non-pneumatic tire is unlikely to "break," the agency has decided to adopt the statement in the petition and express the requirement in terms of "no visual evidence of tread or carcass separation, cracking, or chunking." The agency notes that this will be consistent with the requirements for lateral strength, tire endurance, and high speed performance, which are all expressed in this manner. As a result, the title of the table "Breaking Energy" will be changed to "Minimum Energy Level."

Other Performance Requirements

The NPRM proposed requirements for tire endurance in section S4.2.2.5 and high speed performance in Section S4.2.2.6. The proposals, which were patterned after the requirements in Standard No. 109, were intended to determine the structural integrity and durability of the tire under accelerated laboratory conditions. The agency received no comments about these tests and has decided to adopt them as proposed.

In the NPRM, the agency decided not to propose additional performance requirements explaining its tentative conclusion that the proposed requirements together with the labeling requirements would be adequate to ensure motor vehicle safety. In response to the 1987 request for comments, commenters who expressed an opinion on the matter all stated that no additional performance requirements were necessary. Similarly, in response to the NPRM, no commenter recommended requiring additional performance requirements. After reviewing the matter, the agency is reaffirming its tentative conclusion that the performance requirements, as proposed, together with the labeling requirements, will ensure safety and thus is not requiring any additional performance requirements.

Labeling Requirements in Standard 129

As explained earlier in this notice, the agency is adopting new labeling requirements in S6 of Standard No. 110 and S8 of Standard No. 120. The reader should refer to the discussions in earlier sections of this notice about such issues as a label's permanency, information to be provided about the tire's temporary use and maximum speed, and the tire size labeling/non-pneumatic tire identification code.

In addition to those requirements, the NPRM proposed certain other labeling requirements for non-pneumatic tires. Most of these proposed requirements were patterned after the labeling requirements set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and tire identification number.

GM requested that a load rating not be required on a non-pneumatic tire, claiming this information might cause a motorist to use a non-pneumatic spare tire that would be inappropriate for a vehicle. The agency disagrees with the comment, noting that a tire's load rating is a straight-forward item of information that has been required on pneumatic tires without confusing consumers. The agency believes this information is necessary for safety because some vehicle owners have been known to increase a

vehicle's load capacity by the addition of "helper springs" or "air shocks" to permit the towing of a trailer. Thus, by not requiring load rating information, the agency would increase the potential for a motorist to unknowingly use a vehicle equipped with the non-pneumatic tire in an unsafe manner.

Uniroyal commented that S4.3(f), which proposed requiring labeling with Part 574's tire identification number, should be amended given that that number refers, in part, to tire size. As the agency noted above in its discussion of tire size designations and the NPTIC, it believes that use of the NPTIC is preferable to use of tire size. While the agency agrees that a change is therefore necessary to reflect the NPTIC, it has decided to accomplish this by amending Part 574 to apply to non-pneumatic spare tire assemblies and by amending 574.5(b) to expressly refer to the NPTIC. Section 574.4, "applicability," and 574.6, "identification mark," are also revised to expressly refer to non-pneumatic tires and tire assemblies.

Tire and Rim/Wheel Center Member Matching Information

Section S4.4 proposed that each manufacturer list information about the rim or wheel center member expected to be used with a non-pneumatic tire. The information would be provided to either NHTSA or a tire and rim standardization organization such as The Tire and Rim Association. The proposal, which was patterned after section S4.4 of Standard No. 109 for pneumatic tires, is intended to ensure the dissemination of information about the proper use of non-pneumatic tires with rims.

Uniroyal recommended changing the first sentence of S4.4 to exempt from the section's requirements, a non-pneumatic spare tire that is an integral part of a non-pneumatic spare tire assembly. The agency agrees that such an exemption is appropriate given that the section's purpose is to provide information about the matching of non-integral tires and rims.

GM suggested adding a provision which would allow the required information to be disseminated by inclusion in the "vehicle manufacturer's service parts publications for the vehicle on which it is to be used." The commenter believed this change would help prevent the agency and manufacturers from being "deluged" with descriptions of non-pneumatic rims and wheel center members. Based on its experience with pneumatic tires, NHTSA has decided to reject GM's suggestion because the proposed requirement, i.e., the submission of this information to the agency or through the industry's standardization organizations, will be a more effective way to disseminate this information.

After reviewing this provision, NHTSA has decided to modify S4.4. to require the submission to include the NPTIC. This modification to require the inclusion of the NPTIC rather than the tire size is a conforming change made to reflect another change addressed earlier in the notice. In addition, the agency notes that it proposed in the definition of "test rim" in S3 to require each tire and rim matching information listing to include the load rating. After further review, the agency has determined that it is more appropriate to include this requirement in section S4.4.

IV. *Effective Date*

The NPRM stated that the proposal would become effective 180 days after publication of a final rule in the *Federal Register*. Uniroyal commented that such advance notification is associated with revisions of regulations that affect products already in the marketplace to afford manufacturers time to comply with the changes. Uniroyal then requested that the 180 day period be eliminated or substantially reduced.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. After reviewing the request, NHTSA agrees that there is "good cause" not to require the full 180 day leadin period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers and that the public interest will be served by not delaying the introduction of these alternative tire designs. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, the agency is amending Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars,* and is establishing Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* in Title 49 of the Code of Federal Regulations at Part 571 as follows:

§571.110 [Amended]

1. Paragraph S2 of Standard 110 is revised to read as follows:

S2 *Application.* This standard applies to passenger cars and to non-pneumatic spare tire assemblies for use on passenger cars.

2. Paragraph S3 of Standard No. 110 is amended by adding the following definitions in the proper alphabetical location:

"Non-pneumatic rim" is used as defined in §571.129.

"Non-pneumatic spare tire assembly" means a

non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

"Non-pneumatic tire" and "non-pneumatic tire assembly" are used as defined in §571.129.

"Rim" is used as defined in §571.109.

"Wheel center member" is used as defined in §571.129.

* * * * *

3. Paragraph S4.1 of Standard No. 110 is revised to read as follows:

S4.1 *General.* Passenger cars shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* except that passenger cars may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars* and S6 and S8 of this standard. Passenger cars equipped with such an assembly shall meet the requirements of S4.3(e), S5, and S7 of this standard.

* * * * *

4. Paragraph S4.3(c), (d), and (e) is revised to read as follows:

* * * * *

(c) Vehicle manufacturer's recommended cold tire inflation pressure for maximum loaded vehicle weight and, subject to the limitations of S4.3.1, for any other manufacturer-specified vehicle loading condition;

(d) Vehicle manufacturer's recommended tire size designation; and

(e) For a vehicle equipped with a non-pneumatic spare tire assembly, the non-pneumatic tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of §571.129, *New Non-Pneumatic Tires for Passenger Cars.*

* * * * *

5. Standard No. 110 is amended by adding paragraphs S5, S6, S7 and S8 to read as follows:

S5 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S6 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.*

Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S7 *Requirements for Passenger Cars Equipped with Non-Pneumatic Spare Tire Assemblies.*

S7.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the vehicle trunk lid or an equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S6 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S7.2 *Supplementary Information.* The owner's manual of the passenger car shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S6(a) and (b) and in S4.3(e);

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the passenger car is not recommended with more than one non-pneumatic spare tire in use at the same time.

S8 *Non-Pneumatic Rims and Wheel Center Members*

S8.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

S8.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

§571.120 [Amended]

6. Paragraph S3 of Standard 120 is revised to read as follows:

S3 *Application.* This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles.

* * * * *

7. Paragraph S5.1.1 of Standard No. 120 is revised to read as follows:

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* or §571.119, *New Pneumatic Tires for Vehicles Other than Passenger Cars,* and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 with §571.109, or S5.1 of 571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of 571.129, *New Non-Pneumatic Tires for Passenger Cars,* and S8 and S10 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.6, S7, and S9 of this standard.

8. The introductory text of paragraph S5.3.2 of Standard No. 120 is revised to read as follows:

S5.3.2 *Vehicles Manufactured on or after December 1, 1984.* Each vehicle manufactured on or after December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5, and in the case of a vehicle equipped with a non-pneumatic spare tire, also that specified in S5.3.6, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

* * * * *

9. Paragraph S5.3.6 is added to Standard No. 120 to read as follows:

S5.3.6 The non-pneumatic tire identification code, with which that assembly is labeled pursuant to S4.3(a) of §571.129.

10. Standard 120 is amended by adding paragraphs S7, S8, S9, and S10.

S7 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S8 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S9 *Requirements for Vehicles Equipped with Non-Pneumatic Spare Tire Assemblies*

S9.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the spare tire stowage area or equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S8 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S9.2 *Supplementary Information.* The owner's manual of the vehicle shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S8(a) and (b) and in S5.3.6;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the vehicle is not recommended with more than one non-pneumatic spare tire in use at the same time.

S10 *Non-Pneumatic Rims and Wheel Center Members*

S10.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

S10.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

11. Part 571 is amended by the addition of 49 CFR §571.129 which would read as follows:

§571.129 Standard No. 129; *New Non-Pneumatic Tires for Passenger Cars.*

S1 *Scope.* This standard specifies tire dimensions and laboratory test requirements for lateral strength, strength, endurance, and high speed performance; defines the tire load rating; and specifies labeling requirements for non-pneumatic spare tires.

S2 *Application.* This standard applies to new temporary spare non-pneumatic tires for use on passenger cars.

S3 *Definitions.*

"Carcass" means the tire structure except for the tread which provides the major portion of the tire's capability to deflect in response to the vertical loads and tractive forces that the tire transmits from the roadway to the non-pneumatic rim, the wheel center member, or the vehicle and which attaches to the vehicle or attaches, either integrally or separably, to the wheel center member or non-pneumatic rim.

"Carcass separation" means the pulling away of the carcass from the non-pneumatic rim or wheel center member.

"Chunking" means the breaking away of pieces of the carcass or tread.

"Cracking" means any parting within the carcass, tread, or any components that connect the tire to the non-pneumatic rim or wheel center member and, if the non-pneumatic tire is integral with the non-pneumatic rim or wheel center member, any parting within the non-pneumatic rim, or wheel center member.

"Load rating" means the maximum load a tire is rated to carry.

"Maximum tire width" means the greater of either the linear distance between the exterior edges of the carcass or the linear distance between the exterior edges of the tread, both being measured parallel to the rolling axis of the tire.

"Non-pneumatic rim" means a mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

"Non-pneumatic test rim" means, with reference to a tire to be tested, any non-pneumatic rim that is listed as appropriate for use with that tire in accordance with S4.4.

"Non-pneumatic tire" means a mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle, and does not rely on the containment of any gas or fluid for providing those functions.

"Non-pneumatic tire assembly" means a non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

"Non-pneumatic tire identification code" means an alphanumeric code that is assigned by the manufacturer to identify the tire with regard to its size, application to a specific non-pneumatic rim or wheel center member, or application to a specific vehicle.

"Test wheel center member" means, with reference to a tire to be tested, any wheel center member that is listed as appropriate for use with that tire in accordance with S4.4.

"Tread" means that portion of the tire that comes in contact with the road.

"Tread separation" means the pulling away of the tread from the carcass.

"Wheel" means a mechanical device which consists of a non-pneumatic rim and wheel center member and which, in the case of a non-pneumatic tire assembly incorporating a wheel, provides the connection between the tire and the vehicle.

"Wheel center member" means, in the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle.

S4 *Requirements.*

S4.1 *Size and Construction.* Each tire shall be designed to fit each non-pneumatic rim or wheel center member specified for its non-pneumatic tire identification code designation in a listing in accordance with section S4.4.

S4.2 *Performance Requirements*

S4.2.1 *General.* Each tire shall conform to the following:

(a) Its load rating shall be that specified in a submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for its non-pneumatic tire identification code designation.

(b) It shall incorporate a tread wear indicator that

will provide a visual indication that the tire has worn to a tread depth of 1/16 inch.

(c) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high speed performance procedure specified in S5.5, exhibit no visual evidence of tread or carcass separation, chunking or cracking.

(d) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 tires.

S4.2.2 *Test Requirements.*

S4.2.2.1 *Test Sample.* For each test sample use:

(a) One tire for physical dimensions, lateral strength, and strength in sequence;

(b) A second tire for tire endurance; and

(c) A third tire for high speed performance.

S4.2.2.2 *Physical Dimensions.* For a non-pneumatic tire assembly in which the tire is separable from the non-pneumatic rim or wheel center member, the dimensions, measured in accordance with S5.1, for that portion of the tire that attaches to that non-pneumatic rim or wheel center member shall satisfy the dimensional specifications contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S4.2.2.3. *Lateral Strength.* There shall be no visual evidence of tread or carcass separation, cracking or chunking, when a tire is tested in accordance with S5.2 to a load of:

(a) 1,500 pounds for tires with a load rating less than 880 pounds;

(b) 2,000 pounds for tires with a load rating of 880 pounds or more but less than 1,400 pounds.

(c) 2,500 pounds for tires with a load rating of 1,400 pounds or more, using the load rating marked on the tire or tire assembly.

S4.2.2.4 *Tire Strength.* There shall be no visual evidence of tread carcass separation, cracking or chunking, when a tire is tested in accordance with S5.3 to a minimum energy level of:

Load Rating	*Minimum Energy Level*
Below 880 pounds	1,950 inch pounds
880 pounds and above	2,600 inch pounds

S4.2.2.5 *Tire Endurance.* When the tire has been subjected to the laboratory endurance test specified in S5.4, using, if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.2.2.6 *High Speed Performance.* When the tire has been subjected to the laboratory high speed performance test specified in S5.5, using if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.3 *Labeling Requirements.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides of the tire or tire assembly in letters or numerals not less than 0.078 inches high, the information shown in paragraphs S4.3(a) through (f). Except, in the case of a non-pneumatic tire assembly of which one side always must face outward when mounted on a vehicle, the information shown in paragraphs S4.3(a) through (f) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in S4.4 of this standard or in 49 CFR §571.110 or 49 CFR §571.120.

(a) The non-pneumatic tire identification code.

(b) Load rating, which, if expressed in kilograms, shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole pound;

(c) For a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly, the size and type designation of the non-pneumatic rim or wheel tire assembly that is contained in the submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation;

(d) The name of the manufacturer or brand name;

(e) The symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(f) The tire identification number required by §574.5 of this chapter;

(g) The labeling requirements set forth in S6 of Standard No. 110 (§571.110), or S8 of Standard No. 120 (§571.120).

S4.4 *Non-Pneumatic Tire Identification Code and Non-Pneumatic Rim/Wheel Center Member Matching Information.* For purposes of this standard, S8 of 49 CFR 571.110 and S10 of 49 CFR 571.120, each manufacturer of a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly shall ensure that it provides a listing to the public for each non-pneumatic tire that it produces. The listing shall include the non-pneumatic tire identification code, tire load rating, dimensional specifications and a diagram of the portion of the tire that attaches to the non-pneumatic rim or wheel center member, and a list of the non-pneumatic rims or wheel center members that may be used with that tire. For each non-pneumatic rim or wheel center member included in such a listing, the information provided shall include a size and type designation for the non-pneumatic rim or wheel center member and dimensional specifications and a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire if the non-pneumatic rim's or portion of the wheel center member's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this section. The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires or, in the case of non-pneumatic tires supplied only as a temporary spare tire on a vehicle, in a document furnished to dealers of vehicles equipped with the tires, to any person upon request, and in duplicate to the Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, of at least one of the following organizations:

The Tire and Rim Association

The European Tire and Rim Technical Organization

Japan Automobile Tire Manufacturers' Association, Inc.

Deutsche Industrie Norm

British Standards Institute

Scandinavian Tire and Rim Organization

Tyre and Rim Association of Australia

S5 *Test Procedures.*

S5.1 *Physical Dimensions.* After conditioning the tire at room temperature for at least 24 hours, using equipment with minimum measurement capabilities of one-half the smallest tolerance specified in the listing contained in the submission made by a manufacturer pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation, measure the portion of the tire that attaches to the non-pneumatic rim or the wheel center member. For any inner diameter dimensional specifications, or other dimensional specifications that are uniform or uniformly spaced around some circumference of the tire, these measurements shall be taken at least six points around the tire, or if specified, at the points specified in the listing contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S5.2 *Lateral Strength.*

S5.2.1 *Preparation of the tire.*

S5.2.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.2.1.2 Mount the tire assembly in a fixture as shown in Figure 1 with the surface of the tire assembly that would face outward when mounted on a vehicle facing toward the lateral strength test block shown in Figure 2 and force the lateral strength test block against the tire.

S5.2.2 *Test Procedure.*

S5.2.2.1 Apply a load through the block to the tire at a rate of 2 inches per minute, with the load arm parallel to the tire assembly at the time of engagement and the first point of contact with the test block being the test block centerline shown in Figure 2, at the following distances, B, in sequence, as shown in Figure 1:

B = A − 1 inch
B = A − 2 inches
B = A − 3 inches
B = A − 4 inches
B = A − 5 inches, and
B = A − 6 inches

However, if at any time during the conduct of the test, the test block comes in contact with the non-pneumatic test rim or test wheel center member, the test shall be suspended and no further testing at smaller values of the distance B shall be conducted. When tested to the above procedure, satisfying the requirements of S4.2.2.3 for all values of B greater than that for which contact between the non-pneumatic test rim or test wheel center member and the test block is made, shall constitute compliance to the requirements set forth in S4.2.2.3.

S5.3 *Tire Strength.*

S5.3.1 *Preparation of the Tire.*

S5.3.1.1 If applicable, mount the tire on a non-pneumatic test rim or test wheel center member.

S5.3.1.2 Condition the tire assembly at room temperature for at least three hours.

S5.3.2 *Test Procedures.*

S5.3.2.1 Force the test cleat, as defined in S5.3.2.2, with its length axis (see S5.3.2.2(a)) parallel to the rolling axis of the non-pneumatic tire assembly, and its height axis (see S5.3.2.2(c)), coinciding with a radius of the non-pneumatic tire assembly, into the tread of the tire at five test points equally spaced around the circumference of the tire. At each test point, the test cleat is forced into the tire at a rate of two inches per minute until the applicable minimum energy level, as shown in S4.2.2.4, calculated using the formula contained in S5.3.2.3, is reached.

S5.3.2.2 The test cleat is made of steel and has the following dimensions:

(a) Length of one inch greater than the maximum tire width of the tire.

(b) Width of one-half inch with the surface which contacts the tire's tread having one-quarter inch radius.

(c) Height of one inch greater than the difference between the unloaded radius of the non-pneumatic tire assembly and the minimum radius of the non-pneumatic rim or wheel center member, if used with the non-pneumatic tire assembly being tested.

S5.3.2.3 The energy level is calculated by the following formula:

E =

where

E = Energy level, inch-pounds;

F = Force, pounds; and

P = Penetration, inches

S5.4 *Tire Endurance.*

S5.4.1 *Preparation of the tire.*

S5.4.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.4.1.2 Condition the tire assembly to 100 ± 5° F. for at least three hours.

S5.4.2 *Test Procedure.*

S5.4.2.1 Mount the tire assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the maximum tire width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's non-pneumatic tire identification code designation.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5° F.

S5.4.2.3 Conduct the test at 50 miles per hour (m.p.h.) in accordance with the following schedule without interruption (the loads for the following periods are the specified percentage of the load rating marked on the tire or tire assembly):

	Percent
4 hours	85
6 hours	90
24 hours	100

S5.4.2.4 Immediately after running the tire the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.5.

S5.5 *High Speed Endurance.*

S5.5.1 After preparing the tire in accordance with S5.4.1, if applicable, mount the tire assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's load rating as marked on the tire or tire assembly.

S5.5.2 Break in the tire by running it for 2 hours at 50 m.p.h.

S5.5.3 Allow to cool to 100 ± 5° F.

S5.5.4 Test at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and 85 m.p.h. for 30 minutes.

S5.5.5 Immediately after running the tire for the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.6.

S6 *Nonconforming tires.* Any non-pneumatic tire that is designed for use on passenger cars that does not conform to all the requirements of this standard, shall not be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose.

* * * * *

12. Figures 1 and 2 are added following the text of Standard No. 129, appearing as follows:

Part 574 [Amended]

13. The first sentence of 574.4 *Applicability* is revised to read as follows:

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires, and new non-pneumatic tires and non-pneumatic tire assemblies for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948.

* * * * *

14. The first sentence of 574.5 *Tire identification requirements* is revised to read as follows:

Each tire manufacturer shall conspicuously label on one sidewall of each tire it manufactures, except tires manufactured exclusively for mileage-contract purchasers, or non-pneumatic tires or non-pneumatic tire assemblies, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number

containing the information set forth in paragraphs (a) through (d) of this section.

* * * * *

15. Section 574.5 is amended by adding the following to the end of the opening paragraph:

* * * * *

Each manufacturer of a non-pneumatic tire or a non-pneumatic tire assembly shall permanently mold, stamp or otherwise permanently mark into or onto one side of the non-pneumatic tire or non-pneumatic tire assembly a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by the Federal motor vehicle safety standards shall be positioned relative to the tire identification number as shown in Figure 1, and the symbols to be used for the other information are those listed above. The labeling for a non-pneumatic tire or a non-pneumatic tire assembly shall be in the manner specified in Figure 1 and positioned on the non-pneumatic tire or non-pneumatic tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of the non-pneumatic rim or wheel center member designated for use with that non-pneumatic tire in S4.4 of Standard No. 129 (49 CFR 571.129).

16. Section 574.5(b) is amended by adding the following after the opening sentence:

* * * * *

For a new non-pneumatic tire of a non-pneumatic tire assembly, the second group, of not more than two symbols, shall be used to identify the non-pneumatic tire identification code.

* * * * *

17. Section 574.6, *Identification Mark,* is revised to read as follows:

* * * * *

To obtain the identification mark required by 574.5(a), each manufacturer of new or retreaded pneumatic tires, non-pneumatic tires or non-pneumatic tire assemblies shall apply in writing to "Tire Identification and Recordkeeping," National Highway Traffic Safety Administration, Department of Transportation, Washington, DC 20590, identify itself as a tire manufacturer or retreader and furnish the following information:

(a) The name, or other designation identifying the applicant, and its main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., pneumatic tires for passenger cars, buses, trucks or motorcycles; pneumatic retreaded tires; or non-pneumatic tires or non-pneumatic tire assemblies.

Issued on July 12, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 29581
July 20, 1990

MOTOR VEHICLE SAFETY STANDARD NO. 110

Tire Selection and Rims—Passenger Cars

S1. Purpose and scope. This standard specifies requirements for tire selection to prevent tire overloading.

S2. Application. [This standard applies to passenger cars and to non-pneumatic spare tire assemblies for use on passenger cars. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

S3. Definitions.

"Accessory weight" means the combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio, and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

"Curb weight" means the weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

"Maximum loaded vehicle weight" means the sum of—

(a) Curb weight;

(b) Accessory weight;

(c) Vehicle capacity weight; and

(d) Production options weight.

["Non-pneumatic rim" is used as defined in §571.129.

"Non-pneumatic spare tire assembly" means a non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

"Non-pneumatic tire" and "non-pneumatic tire assembly" are used as defined in §571.129.]

"Normal occupant weight" means 150 pounds times the number of occupants specified in the second column of Table I.

"Occupant distribution" means distribution of occupants in a vehicle as specified in the third column of Table I.

"Production options weight" means the combined weight of those installed regular production options weighting over 5 pounds in excess of those standard item which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

["Rim" is used as defined in §571.109.]

"Vehicle capacity weight" means the rated cargo and luggage load plus 150 pounds times the vehicle's designated seating capacity.

"Vehicle maximum load on the tire" means that load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

"Vehicle normal load on the tire" means that load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I) and dividing by two.

["Wheel center member" is used as defined in §571.129.]

[**(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

S4. Requirements.

S4.1 General. [Passenger cars shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* except that passenger cars may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars* and S6 and S8 of this standard. Passenger cars equipped with such an assembly shall meet the requirements of S4.3(e), S5, and S7 of this standard. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

S4.2 Tire load limits.

S4.2.1. The vehicle maximum load on the tire shall not be greater that the applicable maximum load rating specified in one of the publications described in S4.4.1(b) of Motor Vehicle Safety Standard No. 109 for the tire's size designation and type.

TABLE I

Occupant Loading and Distribution for Vehicle Normal Load for Various Designated Seating Capacities

Designated Seating Capacity, Number Occupants	*Vehicle Normal Load, Number of Occupants*	*Occupant Distribution in a Normally-Loaded Vehicle*
2 thru 4	2	2 in front
5 thru 10	3	2 in front 1 in second seat

S4.2.2 The vehicle normal load on the tire shall not be greater than the test load used in the high speed performance test specified in S5.5 of Motor Vehicle Safety Standard No. 109 for that tire.

S4.3 Placard. A placard, permanently affixed to the glove compartment door or an equally accessible location, shall display the—

(a) Vehicle capacity weight;

(b) Designated seating capacity expressed in terms of total number of occupants and in terms of occupants for each seat location);

(c) [Vehicle manufacturer's recommended cold tire inflation pressure for maximum loaded vehicle weight and, subject to the limitations of S4.3.1, for any other manufacturer-specified vehicle loading condition;

(d) Vehicle manufacturer's recommended tire size designation; and

(e) For a vehicle equipped with a non-pneumatic spare tire assembly, the non-pneumatic tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of §571.129, *New Non-Pneumatic Tires for Passenger Cars.* **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)]**

S4.3.1 No inflation pressure other than the maximum permissible inflation pressure may be specified unless—

(a) It is less than the maximum permissible inflaction pressure;

(b) The vehicle loading condition for that pressure is specified; and

(c) The tire load rating from Table I of Motor Vehicle Safety Standard No. 109 for the tire at that pressure is not less than the vehicle load on the tire for that vehicle loading condition.

S4.4 Rims.

S4.4.1 Requirements. Each rim shall:

(a) Be constructed to the dimesions of a rim that is listed pursuant to the definition of "test rim" in paragraph S3. of §571.109 (Standard No. 109) for use with the tire size designation with which the vehicles is equipped.

(b) In the event of rapid loss of inflation pressure with the vehicle traveling in a straight line at a speed of 60 miles per hour, retain the deflated tire until the vehicle can be stopped with a controlled braking application.

[S5. Load limits for non-pneumatic spare tires. The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S6. Labeling requirements for non-pneumatic spare tires or tire assemblies.

Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numberal not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6.(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S7. Requirements for passenger cars equipped with non-pneumatic spare tire assemblies.

S7.1 Vehicle placarding requirements. A placard, permanently affixed to the inside of the vehicle trunk lid or an equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S6 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S7.2 Supplementary information. The owner's manual of the passenger car shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S6(a) and (b) and in S4.3(e).;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the passenger car is not recommended with more than one non-pneumatic spare tire in use at the same time.

S8. Non-pneumatic rims and wheel center members.

S8.1 Non-pneumatic rim requirements. Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire indentification code, with which the vehicle is equipped.

S8.2 Wheel center member requirements. Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)]**

33 F.R. 14969
October 5, 1968

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection
(Docket No. 1-21; Notice 9)

ACTION: Final rule.

SUMMARY: This rule amends requirements related to key-locking systems to ensure theft protection. The amendment is intended to reduce the potential for accidents caused by shifting the transmission lever on parked vehicles with automatic transmissions. The amendment requires that an automatic transmission vehicle with a "park" position must have a key-locking system that prevents removal of the key unless the transmission is locked in "park" or becomes locked in "park" as the direct result of removing the key. The rule is applicable to passenger cars, and trucks and multipurpose passenger vehicles with a Gross Vehicle Weight Rating of 10,000 pounds or less.

EFFECTIVE DATE: The changes made in this rule become effective for vehicles manufactured on or after September 1, 1992.

SUPPLEMENTARY INFORMATION:

General Background

Standard No. 114, *Theft Protection*, (49 CFR §571.114) specifies requirements for theft protection to reduce the incidence of accidents resulting from the unauthorized use of passenger cars, and trucks and multipurpose passenger vehicles with a gross vehicle weight rating of 10,000 pounds or less. In particular, section S4.2(b) requires that a vehicle have a key locking system that prevents the vehicle's steering or forward self-mobility, or both, when the key is removed.

A. *Steering Lock-Up*

On December 29, 1980, the National Highway Traffic Safety Administration (NHTSA) amended Standard 114 to include performance requirements to prevent a vehicle occupant from inadvertently locking up the steering column of a moving vehicle by removing the ignition key or shutting off the engine (45 FR 85450). However, in response to petitions for reconsideration, the agency determined that inadvertent steering lock-up was not a significant enough problem, at the time, to require additional steps to prevent the possibility of inadvertent steering column lock-up, and therefore rescinded the requirement. The agency noted that it would continue to monitor complaints related to inadvertent steering column lock-up and would initiate rulemaking, if new data warranted an amendment. The agency also encouraged manufacturers to install voluntarily key locking systems that provide improved protection against inadvertent steering column lock-up on their vehicles (46 FR 32251, June 22, 1981).

Since the 1981 notice, callers to NHTSA's Auto Safety Hotline have reported a small number of complaints related to steering lock-ups, both in automatic and manual transmission vehicles. These lock-ups occur most frequently when an occupant removes the key from a moving vehicle's ignition. Key removal typically occurs as a result of "horseplay" within a vehicle or by the driver in panic situations. If the key is removed, the steering will lock in the direction that the driving wheel was last turned.

B. *Transmission Lever Shifting*

NHTSA has also received complaints concerning serious injuries and deaths caused by shifting transmission levers in automatic transmission vehicles parked on an incline. This problem typically occurs when children shift the transmission lever from "park" to "neutral" in a stationary automatic transmission vehicle with the ignition turned off. As a result, the vehicle rolls down the incline. NHTSA is aware of several reported cases in which people, usually children, were seriously injured or killed.

Although the current Standard 114 does not prohibit systems which permit the transmission lever to be shifted when the vehicle is parked with the ignition locked, some manufacturers have voluntarily used a transmission shift lever lock to overcome this safety problem. These transmission shift lever lock designs typically have two critical elements. For automatic transmission vehicles, the transmission shift lever lock requires the transmission shift lever to be in "park" before a person can remove the

ignition key. This device also prevents shifting the transmission lever from "park" to another position once the key is removed. For manual transmission vehicles, the transmission shift lever lock requires the transmission shift lever to be in "reverse" before a person can remove the ignition key. These transmission shift lever locking systems are designed to decrease transmission lever shifting accidents.

Notice of Proposed Rulemaking

On April 5, 1988, NHTSA issued a notice of proposed rulemaking (NPRM) in response to the problems of inadvertent steering column lock-up and inadvertent transmission lever shifting (53 FR 11105). The existing Standard 114 requires that the key-locking system prevent, whenever the key is removed, normal activation of the vehicle's engine or other main source of motive power, and prevent either steering or forward self-mobility, or both. To prevent steering, manufacturers typically have included steering column locks, and to prevent forward self-mobility manufacturers typically have included transmission lever locks.

NHTSA proposed several amendments to paragraph S4.2 of Standard 114. For automatic transmission vehicles, the notice proposed to require the following: 1) an ignition-key locking system that would prevent the shifting of the transmission whenever the key is removed, 2) an ignition-key locking system that would prevent the removal of the key except when the transmission is locked in "park," and 3) for vehicles with a steering column lock, a system that would permit the steering column lock to be engageable only when the transmission was in "park," and the ignition key had deactivated the vehicle's engine or other main source of motive power.

For manual transmission vehicles with a steering column lock, the notice proposed to require that that lock would be engageable only when the ignition key had deactivated the vehicle's engine or other main source of motive power and the operator had performed an additional manual action involving a device other than the ignition key.

NHTSA also requested comments about several issues. First, the agency sought comments on whether the incidence of inadvertent steering column lock-up posed a significant safety problem. Second, the agency asked whether inadvertent transmission lever shifting posed a significant safety problem, especially for manual transmission vehicles. Third, the notice explained the anticipated costs of the proposals and sought additional information to help the agency develop more particularized cost estimates (e.g., unit costs for key locking and ignition systems, production volumes of different types of transmission levers, types of column and transmission lever locking systems). Fourth, NHTSA requested comments concerning alternative lower cost approaches and devices that might be able to reduce the problems of inadvertent steering column lock-up and inadvertent transmission lever shifting. Fifth, the agency sought general observations about whether anticipated designs associated with the proposed standard would be detrimental to theft protection or improperly restrict design flexibility.

The Comments and NHTSA's Response

In the NPRM, NHTSA requested comments by May 20, 1988; however, the agency extended the comment period until July 5, 1988, in response to a petition by the Motor Vehicle Manufacturers Association (MVMA) (53 FR 17732, May 18, 1988).

Forty comments were submitted to Docket 01–21–Notice 7 by motor vehicle manufacturers, insurance companies, police organizations, trade associations, and the public. In addition, in response to their requests, the agency met with several manufacturers (e.g., Mazda, Rolls Royce, Volkswagen) to analyze potential system designs. After reviewing the comments, NHTSA has decided to amend section S4.2(b) related to transmission lever shifting. However, the agency has decided not to amend Standard 114 in relation to steering lock-up. This notice addresses the most significant issues raised in the comments along with the agency's response to the comments.

Safety Need

NHTSA tentatively concluded in the NPRM and the Preliminary Regulatory Evaluation (PRE) that there was a safety problem related to both steering lock-up and transmission lever shifting. The PRE identified a relatively small number of complaints received by the agency related to these safety problems. For instance, the review of incidents of steering column lock-up produced a listing of 13 accidents, 6 injuries, and 2 fatalities. The review of accidents related to transmission lever shifting produced a listing of 23 accidents, 5 injuries, and 4 fatalities related to the engine being turned off and the ignition key removed. In addition, there were another 17 rollaway crashes causing 5 injuries, (but in these cases it was not known whether the ignition key had been removed.) While NHTSA was aware that there was a relatively low level of reported accidents, the agency explained that it continued to receive complaints about these problems, particularly rollaways, resulting in serious injuries. The agency tentatively concluded that the proposed amendments would prevent some fatalities and serious injuries, especially involving children.

In the NPRM, the agency requested comments about whether steering lock-up or transmission le-

ver shifting were significant safety problems for both manual and automatic transmission vehicles. As for key removal and subsequent steering lock-up while a vehicle is in motion, one commenter, who brought a lawsuit based on a fatal accident reportedly caused by such a situation, stated that there was a significant safety need for the proposed amendments. However, Nissan, the defendant in that lawsuit, stated that the jury rejected his allegations pertaining to key removal and subsequent steering lock-up. More generally, Nissan stated that it was unaware of any accidents that have resulted from steering column lock-up as a result of key removal.

The Automobile Importers Association (AIA), BMW, Chrysler, Fiat, Ford, Honda, Nissan, Suzuki, Volkswagen, and Winnebago commented that there was no safety need for measures that would protect against either steering lock-up or transmission lever shifting. For instance, Chrysler stated that the limited number of accidents cited in the PRE out of "billions of vehicle years of exposure" do not indicate that either problem is significant. BMW further stated that the benefits are far less than the costs even if some "accidents have gone unreported." The AIA stated that six fatalities (over 15 years) do not constitute a safety need, especially since the proposals may not be able to guard against accidents caused by "horseplay." In addition, AIA and Honda commented that accidents due to transmission lever shifting could be prevented by activating the parking brake. Suzuki stated that the agency failed to provide evidence that the proposed design changes would reduce the number of these accidents.

In response to these comments, NHTSA has reexamined its proposal to introduce requirements intended to reduce the dangers of steering lock-up and transmission lever shifting. The agency emphasizes that these two problems are distinct and must be analyzed separately. The first, steering lock-up, is associated with removing the key while the vehicle is in motion, thus creating a potential for loss of control due to locking the steering column. The few instances of steering lock-up identified by the agency appear to be associated with adults engaged in horseplay, purposely removing the key, or removing it in an emergency situation. The second, rollaway after the transmission shift lever has been moved to neutral, appears to be associated with children playing with the transmission shift lever.

The agency has searched its accident files and consumer complaint files to identify both types of accidents and the resulting injuries and fatalities. The results of that review are summarized in the Final Regulatory Evaluation (FRE), which has been placed in the docket. As for steering lock-up, the FRE identified three accidents with three injuries and two fatalities that were reported to have resulted from steering lock-up on moving vehicles that occurred after the ignition key was removed. Based on the extremely low number of injuries and fatalities over the course of approximately ten years, NHTSA has decided not to require additional measures designed to prevent the possibility of steering lock-up while the vehicle is in motion. Therefore, the proposals set forth in S4.2(b)(3) and S4.2(c)(2)(B) of the NPRM to prevent steering lock-up in automatic and manual transmission vehicles have not been adopted in this final rule. Nevertheless, as discussed later in this notice, the amendment to prevent transmission lever shifting accidents in automatic transmission vehicles will also serve to prevent the removal of a key while that type of vehicle is in motion, because the amendment permits key removal only when the transmission is in "park."

As for transmission lever shifting, the FRE concluded that 46 accidents, 8 injuries, and 5 fatalities resulted from rollaway situations that the proposed amendments would address. An additional 27 rollaway crashes involving 6 injuries had less information about the status of the engine and the ignition key position, but may be potentially relevant. There were 325 additional accidents resulting when the vehicle "rolled away" or was "rolling." While not enough information was provided to categorize conclusively the accident as preventable by the amended standard, it is likely that some of them could have been prevented. The data indicate that children are the principal victims of transmission lever shifting accidents. The agency has also received several letters outlining similar injuries.

A study focusing on child-injuring rollaway accidents in Orange County, California confirms NHTSA's tentative determination that injuries caused by rolling vehicles pose a significant safety problem. (Agran, Phyllis; Winn, Diane; Castillo, Dawn. "Unsupervised Children in Vehicles: A Risk for Pediatric Trauma," accepted for publication in *Pediatrics*, 1990). That study, which was funded by the Center for Disease Control, was conducted under the hospital monitoring program at the University of California, Irvine. Between April 1987 and March 1989, the study uncovered nine cases of children releasing the brake or moving the transmission shift lever, or both, causing a parked vehicle to roll and injure the child operating the controls or children near the vehicle. Even though two of the cases could be discounted for the purposes of this rulemaking because the vehicle's engine was running and there was insufficient information to draw conclusions about some other situations, the study does establish that the type of accident at issue in this rulemaking, i.e., a motor vehicle being set in motion by an unsupervised child, is occurring. Based on this study, the agency has estimated that there are

roughly 400 to 800 relevant injury producing transmission lever shifting accidents each year nationwide. As the Final Regulatory Evaluation explains in detail, installation of the required technology in the cars and light trucks not voluntarily equipped by the rule's effective date, will prevent an estimated 50 to 100 child-injuring rollaway accidents annually.

Based on the above information, NHTSA has determined that injuries caused in transmission lever shifting situations pose a significant risk to safety. The agency further notes it has a special obligation to reduce injuries involving children and believes this action is consistent with that obligation. In addition, NHTSA believes that these injuries can be prevented at a relatively low cost to manufacturers since most current systems would already comply with the amendments. The agency therefore concludes that there is a safety need which can be effectively met by amending Standard 114 to require automatic transmission vehicles to have key locking systems that prevent transmission lever shifting.

Voluntary Compliance

Chrysler and Ford commented that because they and other manufacturers voluntarily plan to place interlock systems on their vehicles, they did not believe the amendments to Standard 114 were warranted. While the agency welcomes these manufacturers' actions, it finds this argument unpersuasive, because without a mandatory requirement, some manufacturers might not adopt the more safety-oriented key locking systems to prevent accidents and their associated injuries and fatalities, due to transmission lever shifting. In addition, by specifying a requirement, the agency ensures that all manufacturers will introduce systems that will prevent accidents from transmission lever shifting.

Purpose of the Amendment

NHTSA's goal in amending the standard is to provide adequate protection against injuries caused by shifting the automatic transmission lever without compromising the theft protection features of the standard. The agency emphasizes that Standard 114 remains primarily a theft protection standard and that this amendment is not intended to decrease the level of theft protection.

Ford and NATB commented that the term "inadvertent" inaccurately describes some of the accidents because the vehicle occupant's intent is irrelevant to the resulting harm. For instance, a child may intentionally shift an automatic transmission vehicle's lever unaware that these actions will result in a crash. The problem centers on the fact that young children are often unaware of the consequences of their actions. The agency agrees with the commenters that the term "inadvertent" does not appropriately describe many of the situations at issue and further notes that no descriptive term sufficiently describes these situations. Accordingly, NHTSA has decided against including any adjective in the rule to describe the accidents addressed in this rulemaking.

Impact of Amendment on Theft Protection

Allstate Insurance Co., Farmers Insurance Group, NATB, Illinois and Ohio State Police, State Farm Mutual Insurance Co., and United Services Automobile Association commented that the proposal indicates that the agency is less concerned about protecting against vehicle thefts than under the existing standard. For instance, Allstate and the Travelers Companies commented that requiring the transmission lever locking device, which they viewed as a less effective theft protection device than the steering lock-up device, would adversely affect theft protection by encouraging manufacturers to eliminate the steering column lock.

NHTSA notes that all manufacturers commenting on the proposal stated that they plan to retain the current steering column locking mechanism. In addition, an agency review of the plans of non-commenting manufacturers indicated that most of them will include both the steering lock and the transmission lever shift lock. For instance, General Motors (GM) has been providing both devices for several years. This is consistent with Chrysler's prediction that it and other manufacturers would continue to use the steering column lock, because it allows a single generic column design across a product line and because it has been developed and perfected over the past twenty years. Ford noted that if it decided to comply with Standard 114 with only a transmission lever interlock, it would need an anti-theft shield to protect the cable running from the console to the ignition on the steering column.

After considering its proposal in light of the manufacturers' plans to produce vehicles that have both the steering locking devices and transmission shift interlocks, NHTSA concludes that there will not be a reduction in theft protection. In fact, the agency anticipates that the practical effect of these amendments will be to increase the degree of theft protection, since most manufacturers indicated that they will manufacture vehicles with both theft protection devices.

NHTSA is sympathetic to Allstate's and NATB's concern that the NPRM's scope and purpose section (S1) might create the false impression that the standard's focus was shifting away from theft protection. Therefore, section S1 of this final rule deletes the proposed language which would have expanded the "scope and purpose" of the standard beyond theft

protection. The agency notes that this final rule merely specifies requirements for a theft protection device that is already being provided to effectuate the existing standard.

BMW, NATB, the Ohio State Police, and Travelers commented that the transmission lever proposal would be better addressed outside Standard 114, contending that the transmission lever locking device is a safety related mechanism that would erode the theft protection aspects of this standard. NHTSA disagrees with these comments based on the interrelationship between Standard 114's theft protection requirements and a vehicle's transmission. In particular, the agency notes that a transmission lever that locks in the "park" position upon key removal helps prevent an unauthorized person from moving the vehicle. Therefore, NHTSA concludes that the best place for this requirement is in Standard 114, rather than in a different safety standard.

Alternative Designs Related to Automatic Transmissions

Section S4.2(b)(1) and (2) of the NPRM proposed to require that automatic transmission vehicles have an ignition-key locking system that would prevent the shifting of the transmission whenever the key is removed and would prevent the removal of the key except when the transmission is locked in "park." In addition, S4.2(b)(3) proposed to require that if an automatic transmission vehicle had a steering column lock, that lock would be engageable only when the transmission was in "park" and the ignition key had deactivated the vehicle's engine or other main source of motive power. The NPRM also requested comments on alternative approaches and devices that might be able to reduce the problems of steering lock-up and gear shifting. Fiat, Honda, Nissan, Rolls Royce, Subaru, and Toyota commented about these proposed requirements and suggested some alternative types of key locking/transmission lever shifting systems on automatic transmission vehicles.

Fiat and Nissan commented that the proposals established overly precise requirements, which would limit new designs and innovations. Fiat suggested that the agency specify more general requirements and leave the specific choice of design to the manufacturer. In response to Fiat's suggestion, the agency has broadened the proposed requirements specified in the NPRM, wherever such changes would not adversely affect theft protection or safety. Nevertheless, NHTSA cannot agree with Fiat's suggestion to eliminate the proposed subparagraphs of S4.2(b), because specific performance requirements are necessary to promote safety. This notice will address the specific modifications below.

NHTSA notes that section S4.2(b)(1) in the NPRM proposed that "the ignition key-locking system shall also prevent shifting the transmission whenever the key is removed." After closer review, the agency concludes that section S4.2(b)(1) is not necessary because the requirements in S4.2(b)(2) automatically prevent the situation in S4.2(b)(1). Therefore, the final rule does not include the proposed section S4.2(b)(1).

NHTSA notes that section S4.2(b)(2) in the NPRM proposed that "The key-locking system shall not permit removal of the key except when the *transmission is locked in "park."* (emphasis added). This provision was intended to lock either the transmission directly or the transmission shift lever and not just the transmission *per se.* Based on discussions with manufacturers indicating that this phrase was typically interpreted as referring to the transmission lever and the fact that most anti-shift locks act to lock the transmission by preventing the shifting of the transmission lever, NHTSA is satisfied that the phrase "transmission is locked in 'park' " was interpreted as a shorthand for "transmission or transmission lever is locked in 'park.' " The agency has therefore added a reference to the transmission lever in section S4.2(b) of the final rule and is confident that this clarification will not adversely affect any party.

Rolls Royce's Electrical Transmission Lock

Rolls Royce commented that its electrically activated transmission parking lock would meet the proposal's intent but not the proposed language specified in S4.2(b)(2). It explained that an electric gear range selector lever controls an electrically powered mechanical gear range actuator, which produces the mechanical energy needed to select a transmission range on all its automatic transmission vehicles. When the key is removed from the dashboard-mounted key and lock system, an electric switch automatically causes the electrically powered gear range actuator to lock the transmission in "park," irrespective of the gear selector lever's position. As a result, forward self mobility is prevented in compliance with the existing Standard 114. In addition, this design adheres to the proposal's intent, because once the key is removed, moving the lever will not disengage the transmission lock, so the vehicle cannot roll away. However, it would not comply with the proposal's wording because the system is not "locked" instantaneously when the key is removed, but locks momentarily afterward when the electric motor engages the lock. Rolls Royce requested that the agency modify the wording of section S4.2(b)(2) to allow their type of locking system.

After reviewing Rolls Royce's comments, NHTSA has decided to issue a final rule that will permit a design such as the one proposed by Rolls Royce. The

agency believes that Rolls Royce's system will prevent the rolling of a vehicle as effectively as the other systems designed to comply with the language proposed in S4.2(b)(2). In the final rule, this provision is now designated S4.2(b) to reflect the changes in the final rule compared to the proposal. In addition, the agency notes that neither it nor Rolls Royce is aware of any accidents involving the roll away of these vehicles, which have been equipped with this system for over twenty years. Accordingly, the final rule permits a key locking system in which key removal directly causes the transmission or transmission lever to become locked in "park." In particular, this provision permits the Rolls Royce's key locking system in which there is a momentary shifting of the transmission before the automatic action locks the transmission in "park." The agency is confident that the time interval related to the momentary shifting will not pose any danger in rollaway situations. Therefore, a manufacturer may comply with section S4.2(b) in the final rule either by a key locking system similar to Rolls Royce's system or by a key locking system that prevents key removal unless the transmission or transmission shift lever is locked in "park."

Electrical Transmission Shift Lock Systems: Emergency Overrides and Key Release Systems

The proposal to require a transmission shift lock on vehicles with automatic transmission creates a potential compliance problem for a few manufacturers which have been planning to install electrical transmission shift lock systems. Honda, Mazda, Nissan, Subaru, and Toyota stated that electrical transmission shift lock systems could result in safety problems if the battery or electrical system failed. In such a situation, it would be impossible to move these vehicles unless there was an override device which would permit shifting the lever out of the "park" position.

The commenters stated that their electrical transmission shift lock systems would not comply with the requirements proposed in S4.2(b)(1) and S4.2(b)(2). Honda, Nissan, and Toyota requested that S4.2(b)(1) be modified to allow for an emergency override device so that a disabled vehicle could be moved. In addition, Nissan, Toyota, and Subaru requested that S4.2(b)(2) be modified to permit key removal, even if the transmission was not in "park." Subaru requested that the agency issue a supplemental notice to explore the problems related with a mechanical override.

Toyota explained that it was developing an electrically operated interlock override function to allow the transmission to be shifted from "park" to allow a disabled vehicle to be moved. This emergency override would engage only when the driver depresses and holds down the override button. Accordingly, Toyota requested that the agency amend S4.2(b)(1) to include the phrase ". . . except that an emergency override may be provided to enable movement of a disabled vehicle." Toyota further explained that the electrical interlock system is designed to automatically shut off, if the key is left in the "ACC" position for an hour. Therefore, it requested an emergency system to allow key release even if the transmission were not placed in "park."

Honda stated that if its electrical system failed, it would be impossible to shift the transmission lever out of "park" without a mechanical emergency override. Therefore, it requested the agency to allow such an override provided such a system would prevent inadvertent operation. From Honda's comments, it was not clear whether the override could be activated without the key in the ignition.

Nissan explained that it is developing a system which would prevent shifting the transmission lever out of the "park" position, unless the key is at the "on" position *and* the brake pedal is depressed. Nissan commented that along with an emergency override, the standard should allow for an emergency key release system by which a key could be removed even if the vehicle was not in "park." The commenter stated that this system was necessary in case the battery failed. Nissan concluded that Standard 114 should allow for an emergency gear shift release system that could be released only by a "manual action other than normal gear shift lever manipulation."

Mazda demonstrated to NHTSA staff a prototype gear shift mechanism with an emergency release button. In this system, a spring-loaded emergency release button located on the console near the base of the shifter allows the driver to disengage the gear shifter manually by pushing back and holding the emergency release button at the same time he or she moves the shifter out of park. The location and design of this device requires a two-handed operation to release the lock. This override device could be activated without the key being in the key locking system.

Subaru also stated that a release button should be required to permit moving the transmission lever out of "park" in the case of a dead battery. Subaru did not explain whether the key was necessary to operate this override. It also requested an emergency key release button to allow removing a key from the ignition switch if the transmission were not in "park." Because some of these systems might be inconsistent with the proposals in the NPRM, Subaru requested that the agency issue a supplemental notice.

After evaluating these comments, NHTSA con-

cludes that a mechanical override system can be installed consistent with the NPRM, provided the override is only activated by the key used to control the vehicle. This permits the manufacturer to install a manual override system that is tied to either the ignition part of the key-locking system or an auxiliary part of the key-locking system that may be located near and/or is part of the manual override device. As a result, a vehicle could be moved if it experiences an electrical failure. The agency emphasizes that an override that could be operated without requiring a key might be detrimental to theft protection since an unauthorized person could operate that type of manual override. The agency has decided that a superior approach is to permit a manual override to the electrical shift system, but only if such an override has to be operated by the key used to control the vehicle. This appears consistent with Nissan's manual override system. The agency believes that this will permit a person to move a disabled vehicle without jeopardizing theft protection.

The agency acknowledges that this requirement may differ slightly from the override systems initially anticipated by some manufacturers, which could be activated regardless of the key being in the key locking system. However, the agency does not anticipate that compliance will be overly burdensome, especially since the rule permits a manufacturer to install a manual override system tied to either the ignition part of the key locking system or an auxiliary part of the key locking system near the manual override device.

As noted above, Toyota, Nissan and Subaru described systems that would permit key removal, even if the vehicle's transmission was not in "park." This would permit an individual to remove the key even though the battery or electrical system had failed. The commenters requested that S4.2(b)(2) be modified to allow key removal even if the transmission was not in "park."

In response to this concern about an electrical failure or a dead battery, the agency notes that this typically occurs when the vehicle is parked and the lights or another auxiliary system are left on for long periods of time. In such situations, the vehicle would usually be in the "park" position. In the unusual situation of electrical failure when the vehicle's transmission is not in "park," a transmission with an electrical shift lock system could simply be mechanically shifted to "park," where the system could be designed to mechanically lock in "park" even without the electrical power so that the key could be removed. Therefore, the agency does not foresee the need to remove a key while the transmission is in a position other than "park." NHTSA concludes that changing the requirements to permit key removal while the transmission is in a position other than "park" is not necessary and would be detrimental to theft protection since an unauthorized person could operate that type of key release. Accordingly, NHTSA has decided not to modify the section, which is now S4.2(b), to allow for key removal when the transmission is in a position other than "park."

Miscellaneous Comments Related to Automatic Transmission Vehicles

Sections S4.2(b)(2) and (3) of the proposed amendment included references to the "park" position in automatic transmission vehicles. BMW commented that, while no safety standard requires the "park" position in automatic transmission vehicles, this proposal might be misinterpreted as requiring the "park" position for transmissions in such vehicles. The agency agrees with BMW that no safety standard requires the "park" position and takes this opportunity to clarify this understanding in S4.2(b). NHTSA further notes that requiring a "park" position would necessitate a rulemaking beyond the scope of this notice.

In sections S4.2(a), (b), and (c) of the proposed amendment, the agency specified that each vehicle subject to the standard must have an "*ignition* key-locking system" (emphasis supplied). BMW commented that requiring an "*ignition* key-locking system" rather than the more general "key-locking system," was overly specific and might wrongly imply that the ignition is the component that must be interrupted in order to prevent normal activation of the engine. NHTSA agrees with BMW that including the term "ignition" is unnecessarily specific and thus has omitted this term in the final rule.

NHTSA notes that both the current Standard 114 at S4.(2)(a) and the NPRM at S4.2(a) and S4.2(b)(3) include the phrase "other main source of motive power." The agency interprets this phrase as being synonymous with the term "motor," since any known means of mechanical propulsion other than an engine requires some type of motor. Accordingly, in the interests of eliminating superfluous words, this final rule substitutes the term "motor" in place of the phrase "other main source of motive power."

Manual Transmission Vehicles

The NPRM asked whether inadvertent gear shifting presented a significant safety problem for manual transmission vehicles. The commenters indicated that there was no safety need related to the roll away of manual transmission vehicles, and the agency's independent review of the accident statistics confirmed this view. Accordingly, the agency has decided not to require manual transmission vehicles to contain an interlock.

With respect to the technology proposed for man-

ual transmissions to protect against steering lockup, several commenters suggested changes that would be less design restrictive and more practical than proposed in the NPRM. While these comments may have merit, the agency's conclusion that steering lockup as the result of key removal is not a significant enough safety problem to justify additional requirements makes the issue moot.

Harmonization

The European Economic Community (ECE's) Regulation No. 18 provides comprehensive requirements related to theft protection. That regulation requires a manufacturer to install a protective device whose activation prevents one of three events: a vehicle being steered, its being driven, or its being moved forward under its own power. In other words, a manufacturer has the option of complying with ECE Regulation No. 18 in one of three ways. In contrast, the amended Standard 114 requires an anti-shift device for any automatic transmission vehicle with a "park" position. In the PRE, NHTSA tentatively concluded that vehicles complying with the proposed amendments to Standard 114 also would comply with ECE Regulation No. 18. However, the agency noted that some designs that comply with ECE Regulation No. 18 would have to be modified to comply with the new U.S. requirements. For instance, if a manufacturer wished to comply with ECE Regulation No. 18 with a steering lock, it would be possible to remove the key from the ignition of an automatic transmission vehicle conforming to Regulation No. 18 without locking up the transmission lever or gearshift control as required by this rulemaking.

Volkswagen, Mercedes, and Range Rover commented that the amendments present problems related to harmonization. Volkswagen stated that most manufacturers would not remove the steering column lock, because it was required by ECE Regulation No. 18. As a result, cost savings were not likely. (As noted above, the steering lock is an option and not a requirement of ECE Regulation No. 18.) Range Rover commented that while the amendments would comply with international standards, the amendments would cause conflicts with current designs used to meet these international standards and would result in additional costs, especially if the leadtime were unreasonably short. Mercedes stated that the amendments would be contrary to harmonization because they add requirements for locking systems that go beyond protection against theft.

After reviewing these comments, NHTSA concludes that even though the amendment introduces a requirement that ECE Regulation No. 18 does not specifically contain, this change will not significantly hinder harmonization. Because the new requirement does not significantly differ from ECE Regulation No. 18 and most manufacturers already comply or voluntarily plan to comply with this amendment, the agency believes that the practical effect of this rule will be minimal. In addition, NHTSA believes that the amendments provide the additional benefit of enhancing theft protection and safety since most manufacturers plan to use both a transmission lever interlock and a steering column lock. In addition, the agency has minimized any hardships related to harmonization by providing adequate leadtime. The agency believes that this will mitigate the problems associated with Volkswagen's and Range Rover's concerns and provide adequate time to allow manufacturers to modify any designs.

Leadtime

The NPRM proposed to give two years of leadtime between the publication of the final rule and the effective date of the amendments. AIA, BMW, Chrysler, Ford, Mercedes, and Jaguar noted that a three-year leadtime, with an effective date of September 1, 1992 (model year 1993) was necessary to allow for the redesign, retooling, and product testing of vehicles. In the alternative, if the agency specified a two-year leadtime, BMW, Chrysler, Ford, and Honda stated that a phase-in would be necessary to accommodate vehicle lines that were being phased-out. For instance, Ford requested that if the agency published a final rule with an effective date before model year 1993, then the agency should implement a phase-in process that would require no more than 90 percent of a manufacturer's production of automatic transmission vehicles to be in compliance by model year 1992 (with 100 percent compliance by model year 1993). Ford explained that it is voluntarily equipping all of its vehicles with floor-mounted automatic transmission shift controls with an ignition/shift control interlock system by the 1993 model year. Ford requested a phase-in to accommodate those vehicle lines that are being redesigned over that time period. Chrysler also requested an effective date no earlier than September 1, 1992 (model year 1993), or in the alternative a two-year phase-in beginning no earlier than September 1, 1991.

Volkswagen stated that a leadtime of two model years would be sufficient to allow compliance with the amendments. It emphasized that the effective date should refer to model year rather than "two years after the date on which the final rule is published" to avoid requiring mid-model year modifications. Range Rover stated that the proposed leadtime was unduly burdensome, especially on a small manufacturer such as itself, but did not specify a leadtime it viewed as adequate. Mitsubishi

explained that a leadtime before model year 1992 would restrict unreasonably its plans for model year 1991 in which it plans to change four car lines and drop one line. Honda noted that at a minimum, a two-year leadtime would be necessary. In the alternative, Honda stated that a phase-in program would ease the burdens of cost and leadtime.

After reviewing this issue, NHTSA has concluded that the proposed two-year leadtime is proper given that it would not unreasonably increase the costs associated with adopting these amendments. The agency believes that phasing in by a percentage of production is unnecessary given the provided leadtime. Accordingly, the agency has determined that an effective date of September 1, 1992 is appropriate for this final rule.

Costs

In the NPRM, NHTSA estimated that the proposed amendments would cost the consumer approximately $6.25 for each automatic transmission vehicle. This was attributable primarily to adding a gear shift lever locking mechanism to vehicles with a console-mounted automatic transmission. NHTSA estimated that the proposed amendments would affect 3.3 million cars and light trucks. The agency believed that there would be a cost savings of $2.50 per vehicle if the manufacturers decided to delete the steering column locks from all 11.2 million automatic transmission vehicles. This led the agency to conclude that there would be a net cost savings of $7.4 million annually if the manufacturers eliminated the steering column lock. In addition, the NPRM estimated that the proposal would affect 1.5 million manual transmission cars and light trucks at a consumer cost of about $2.50 per vehicle, or a total annual cost of $3.75 million. The NPRM sought additional data about the production volumes of different types of transmission shifts and column and gear shift lever locking systems to better estimate the costs associated with these amendments.

BMW, Chrysler, Ford, Honda, Range Rover, Subaru, Volkswagen, and Winnebago commented that the cost analysis understated the costs of the proposed amendment. Commenters' estimates of the cost of technologies that would meet the proposed requirements ranged from $7 to $70 dollars. In addition, BMW, Ford, Chrysler, Volkswagen, and Honda noted that they did not intend to eliminate the steering column lock. Therefore, there would be no cost savings related to the final rule. Ford noted that it had cost $11 to modify the key locking systems on its 1988 Tempo and Topaz vehicles to comply with a design similar to the proposal. Chrysler estimated that the retail price equivalent of compliance for automatic transmission vehicles would be approximately $14 for most of its vehicles, but for some vehicles with shorter life cycles the price could be as high as $29 per vehicle. Winnebago stated that the costs are unreasonable, especially for small manufacturers like itself. Volkswagen stated that the modifications would be more expensive for it than other manufacturers because it currently does not provide a transmission lever lock which is operational when the ignition is turned off. Subaru stated that changes on automatic transmission vehicles would cost 10,000 yen (or approximately $70) for a system that includes an interlock with the brake. That company also estimated that changes on manual transmission vehicles would cost 1,000 to 5,000 yen (approximately $7 to $35), the higher cost being for a system that interconnects the ignition key lock to another safety system, such as the parking brake. Such systems go beyond what is being required; therefore, the agency did not use these higher unit costs in estimating the cost of the amendment. Range Rover disputed the NPRM's cost analysis, especially in relation to the agency's initial view of a cost savings. Rolls Royce estimated that it would cost $14.50, $19.50, or $29.50 per vehicle depending on the design it adopted. The agency notes that Rolls Royce's cost estimates may not be relevant because its current system will most likely comply with the final rule.

After reviewing these comments, NHTSA has determined that it should modify some of its cost estimates. For instance, the agency agrees with the commenters that there will be no cost savings related to the removal of the steering column lock. The agency emphasizes that an important consideration is that many vehicles already comply or will be brought voluntarily into compliance with the amendments. For automatic transmission vehicles, the agency determined that 7,702,000 1987 MY cars and light trucks currently comply with the new requirements and that 3,536,000 do not. Of those not currently in compliance, 3,066,000 will be brought voluntarily into compliance by September 1, 1992. Therefore, the agency anticipates that an additional 470,000 vehicles will be modified as a result of the amendments.

In estimating the consumer cost of this amendment, NHTSA believes that its unit cost estimate in the PRE of between $5.75 and $6.75 is reasonably accurate for a system to meet the requirements for automatic transmission vehicles. However, the agency acknowledges the cost data provided by commenters and will use the PRE's value of $6.75 as the lower end of the cost estimate range and Chrysler's estimate of $14 as the upper end of the cost estimate range. The agency has decided not to use Subaru's estimate of $70 per vehicle, because this system is also intended to protect against "unintended acceleration," and thus is more costly than technologies

necessary to comply with the subject regulation. Accordingly, NHTSA estimates that the annual consumer cost of complying with the automatic transmission requirement as follows: $6.75 to $14.00 (cost per vehicle) × 470,000 vehicles (vehicles modified because of the standard) = $3,173,000 to $6,580,000.

In summary, NHTSA believes that the cost of this rulemaking is the cost of compliance for those manufacturers who would not have voluntarily modified their vehicles in order to meet the new requirement. Based on the above estimates, the agency anticipates the total annual cost for these amendments will range from $3.2 million and $6.6 million.

In consideration of the foregoing, 49 CFR 571.114 is amended as follows:

§ 571.114 Standard No. 114 Theft Protection

1. Section S1 of Standard 114 is revised to read as follows:

S1 *Purpose and Scope* This standard specifies requirements for theft protection to reduce the incidence of accidents resulting from the unauthorized operation of a vehicle.

2. S4.2 is revised to read as follows:

S4.2 Each vehicle shall have a key-locking system that, whenever the key is removed, prevents:

(a) the normal activation of the vehicle's engine or motor; and

(b) either steering or forward self-mobility of the vehicle or both. For a vehicle equipped with an automatic transmission with a "park" position, the key-locking system shall prevent removal of the key unless the transmission or transmission shift lever is locked in "park" or becomes locked in "park" as the direct result of removing the key.

3. S4.3 is revised to read as follows:

S4.3 The prime means for deactivating the vehicle's engine or motor shall not activate the key-locking system described in S4.2(b).

Issued on: May 22, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 21868
May 30, 1990

MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection—Passenger Cars

(Docket 1-21; Notice 5)

S1. Purpose and scope. This standard specifies requirements for theft protection to reduce the incidence of accidents resulting from unauthorized [operation of a vehicle.]

S2. Application. This standard applies to passenger cars and to trucks and multipurpose passenger vehicles having a GVWR of 10,000 pounds or less.

S3. Definitions. "Combination" means one of the specifically planned and constructed variations of a locking system which, when properly actuated, permits operation of the locking system.

"Key" includes any other device designed and constructed to provide a method for operating a locking system which is designed and constructed to be operated by that device.

"Vehicle type" refers to "passenger car," "truck," or "multipurpose passenger vehicle," as those terms are defined in 49 CFR §571.3.

S4. Requirements.

S4.1. Each truck and multipurpose passenger vehicle having a GVWR of 10,000 pounds or less manufactured on or after September 1, 1983 and each passenger car shall meet the requirements of S4.2, S4.3, S4.4, and S4.5. However, open-body type vehicles that are manufactured for operation without doors and that either have no doors or have doors that are designed to be easily attached to and removed from the vehicle by the vehicle owner are not required to comply with S4.5.

S4.1.1 Passenger cars manufactured before September 1, 1982, shall meet the requirements of S4.2, S4.4, S4.6, and S4.7 or the requirements listed in S4.1.2.

S4.1.2 Passenger cars manufactured on or after September 1, 1982, shall meet the requirements of S4.3, S4.5, S4.6, and S4.7.

S4.1.3 Trucks and multipurpose passenger vehicles having a GVWR of 10,000 pounds or less manufactured on or after September 1, 1983, shall meet requirements of S4.3, S4.5, S4.6, and S4.7.

S4.2 Each vehicle shall have a key-locking system that whenever the key is removed, will prevent—

(a) The normal activation of the vehicle's engine or [motor; and]

(b) either steering or forward self-mobility of the vehicle, or both. [For a vehicle equipped with an automatic transmission with a "park" position, the key-locking system shall prevent removal of the key unless the transmission or transmission shift lever is locked in "park" or becomes locked in "park" as the direct result of removing the key. **(55 F.R. 21868—May 30, 1990. Effective: For vehicles manufactured on or after September 1, 1992)**]

S4.3 [The prime means for deactivating the vehicle's engine or motor shall not activate the key-locking system described in S4.2(b). **(55 F.R. 21868—May 30, 1990. Effective: For vehicles manufactured on or after September 1, 1992)**]

S4.4 For each vehicle type manufactured by a manufacturer, the number of different combinations of the key-locking systems required by S4.2 shall be at least 1,000, or a number equal to the number of vehicles of that type manufactured by such manufacturer, whichever is less. The same combinations may be used for more than one vehicle type.

S4.5 A warning to the driver shall be activated whenever the key required by S4.2 has been left in the locking system and the driver's door is opened. The warning to the driver need not operate—

(a) After the key has been manually withdrawn to a position from which it may not be turned;

(b) When the key-locking system is in the "on" or "start" position; or

(c) After the key has been inserted in the locking system and before is has been turned on.

S4.6 The number of different combinations of the key-locking systems required of each manufacturer for a type of vehicle shall be at least 1,000, or a number equal to the number of vehicles of that type manufactured by such manufacturer, whichever is less.

S4.7 A warning to the driver shall be activated whenever the key required by S4.2 or S4.3 has been left in the locking system and the driver's door is opened. The warning to the driver need not operate—

(a) After the key has been manually withdrawn to a position from which it may not be turned;

(b) When the key-locking system is in the "on" or "start" position; or

(c) After the key has been inserted in the locking system and before is has been turned.

Issued on December 22, 1980

45 F.R. 85450
December 29, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars (Docket No. 87-12; Notice 3) RIN 2127-AC18

ACTION: Final Rule.

SUMMARY: This notice amends Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars,* to permit new passenger cars, multipurpose passenger vehicles, and light trucks equipped with passenger car tires to be equipped with a non-pneumatic spare tire. These standards had required all new vehicles to be equipped with pneumatic tires. The notice also establishes requirements requiring non-pneumatic tires to bear a label stating that the tires are to be used only as a temporary spare tire and only at limited speeds. It requires the manufacturer to place a placard in the vehicle and information in the owner's manual explaining the proper use of these tires. In addition, the notice establishes Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* which includes definitions relevant to non-pneumatic tires and specifies performance, testing, and additional labeling requirements for these tires. In particular, the new standard contains performance requirements related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. The agency has determined that these requirements provide the basic tests to ensure the structural integrity of non-pneumatic tires. To ensure an even higher degree of safety, a non-pneumatic tire must be labeled for use only as a temporary spare tire at limited speeds. NHTSA believes that these performance requirements together with these labels ensure the safety of non-pneumatic tires.

EFFECTIVE DATE: The rule is effective on August 20, 1990.

SUPPLEMENTARY INFORMATION:

I. *General Information*

Federal Motor Vehicle Safety Standard No. 110, *Tire Selection and Rims* (49 CFR §571.110), specifies requirements for the selection of tires to be used on passenger cars. Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars* (49 CFR §571.120), specifies similar requirements for the selection of tires to be used on vehicles other than passenger cars. The purpose of these standards is to prevent tire overloading and to facilitate the proper matching of a tire and rim to a vehicle. They also require a vehicle manufacturer to place in each new vehicle a placard bearing information to ensure use at the proper inflation.

Section S4.1 of Standard No. 110 requires passenger cars to be equipped with tires that meet the requirements of §571.109, "New Pneumatic Tires—Passenger Cars." (49 CFR §571.109) Section S5.1.1 of Standard No. 120 similarly requires vehicles other than passenger cars to be equipped with pneumatic tires that meet the requirements of Standard No. 109 or Standard No. 119 "New Pneumatic Tires for Vehicles Other Than Passenger Cars" (49 CFR §571.119).

Standard No. 109 expressly applies only to new pneumatic tires which it defines as "mechanical device(s) . . . (that) contain the *gas* or fluid that sustains the load." (emphasis added) The standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength (in vertical loading), tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

The practical effect of Standard No. 109's applicability to only pneumatic tires, together with Standard No. 110's requirement that passenger cars must be equipped with tires that meet Standard No. 109's requirements, is to prohibit any new passenger car from being equipped with non-pneumatic tires. Similarly, Standard Nos. 109, 119 and 120 together prohibit any vehicle subject to Standard No. 120 from being equipped with non-pneumatic tires.

A non-pneumatic tire is a mechanical device which serves the same function as a pneumatic tire. That is, it transmits the vertical load and tractive forces from the roadway to the vehicle and generates the tractive forces that provide the directional con-

trol of the vehicle. However, the non-pneumatic tire differs from the pneumatic tire in that the former does not rely on air pressure or the containment of any gas or fluid for providing those functions. A non-pneumatic tire may be designed in many different ways. For instance, it may be solid rubber to which tread is attached; it may be part of an assembly in which the wheel is attached to the tire and tread; or it may contain the tread, tire, rim, and wheel. Further, many different materials may be used in constructing the tire assembly. Because non-pneumatic tires present an emerging technology, it is likely that tire manufacturers may develop new designs and use materials that are currently not known or contemplated.

In view of Standard No. 109's and Standard No. 110's prohibition of tires other than pneumatic tires on motor vehicles, General Motors (GM) petitioned the agency to amend Standard No. 109 to allow non-pneumatic spare tire assemblies for temporary use on passenger cars. The petitioner suggested performance requirements and test conditions for non-pneumatic tires that would address characteristics such as the endurance, high speed performance, strength (in vertical loading), and lateral strength of the non-pneumatic tire. In large part, GM used the existing requirements in Standard No. 109 as a guide for selecting the performance requirements and test conditions for the requested amendment. It changed the requirement and test related to the bead unseating resistance, which specifically relates to pneumatic tires, and also changed the test procedure and strength requirements for the tire's ability to withstand concentrated vertical loads. In addition, GM suggested certain labeling requirements including a warning that the tires would be for temporary use.

GM submitted its petition in connection with its work with Uniroyal Goodrich Co. (Uniroyal) to develop a spare non-pneumatic tire which it intends for only temporary use. The petitioner believes that the agency's adoption of its requested amendment would reduce the weight and size of the spare tires used in passenger cars, resulting in reduced costs, improved reliability and servicability, and minor improvements in fuel economy. Because a non-pneumatic tire is not dependent on air pressure, it would not be subject to problems associated with low inflation pressure such as a blow out or bead unseating during hard cornering.

On September 23, 1987, NHTSA issued a notice announcing the grant of GM's petition and requesting comments about non-pneumatic tires (52 FR 35740). The notice invited comment about what requirements would be necessary to ensure the safe use of a non-pneumatic tire. In response to that notice, NHTSA received comments from various motor vehicle and tire manufacturers as well as the Rubber Manufacturers Association. NHTSA considered each of these comments in developing a notice of proposed rulemaking (NPRM) which it published on April 7, 1989 (54 FR 14109).

II. *Notice of Proposed Rulemaking*

In the NPRM, NHTSA proposed to amend Standard No. 110 to permit the use of non-pneumatic tires on passenger cars, but only as a temporary spare and to establish a new standard for non-pneumatic tires. The notice requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109. As a general proposition, the NPRM explained that in developing the new safety standard, the agency desired to formulate a generic one that would be applicable to as many potential designs of non-pneumatic tires as possible rather than one that was based on a specific design, which might inadvertently restrict future developments and skew innovations toward the initial design.

More specifically, the notice proposed three amendments to Standard No. 110. First, it proposed that section S4.1 be amended to allow passenger cars to be equipped with a non-pneumatic spare tire. Second, the notice proposed that Standard No. 110 contain additional labeling requirements and vehicle placarding requirements explaining that such tires should be used only as a spare tire on a temporary basis at speeds not to exceed 50 m.p.h. Third, the notice proposed that safety information about the use of a non-pneumatic tire be included in the owner's manual of the passenger car.

The proposed new safety standard was Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars.* According to the proposal, the new standard, which was patterned after Standard No. 109, would include definitions relevant to non-pneumatic tires and specify performance requirements, testing procedures, and labeling requirements for these tires. To regulate performance, the new standard would contain performance requirements and tests related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. While the agency considered proposing requirements related to additional factors such as handling and braking, it tentatively determined that the proposed requirements would adequately ensure motor vehicle safety by providing the basic tests necessary to ensure the structural integrity and durability of non-pneumatic tires.

The NPRM also proposed to supplement the labeling requirements in Standard No. 110 by including in Standard No. 129 labeling requirements similar

to those set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and the tire identification number. The notice proposed to allow methods of marking other than "molding," provided the marking was permanent because the agency tentatively concluded that it might be difficult to mold the required information on some types of anticipated non-pneumatic tire designs. The agency also tentatively concluded that the temporary use and maximum speed labeling requirements would provide an extra margin of safety related to handling and braking. In addition, the agency noted that compact pneumatic T-type tires that are currently used as temporary spare tires have been shown to be safe, even though they are not subject to performance requirements beyond those applicable to full size tires in Standard No. 109. The agency believed that in some respects this comparison was relevant since, like the compact T-type pneumatic tires, the non-pneumatic tires allowed by these amendments would be limited to use as temporary spare tires.

The agency tentatively concluded that the proposed performance requirements, together with the proposed labeling requirements, would remove a restriction in the existing standards on technological innovation while still ensuring that the new non-pneumatic tires met the need for safety.

III. *The Comments and the Agency Response*

NHTSA received 13 comments in response to the NPRM. In general, all commenters supported the proposal to permit a vehicle to be equipped with a non-pneumatic spare tire. The agency has considered the points in the comments in developing this final rule. The commenters' significant points are addressed below, along with the agency's response to the comments. For the convenience of the reader, this notice follows the regulatory text's order.

A. *Proposal to Amend Standard No. 110*

Definitions

The NPRM proposed to add definitions to paragraph S3 for "non-pneumatic spare tire assembly," "non-pneumatic tire," "non-pneumatic tire assembly," "rim," and "wheel center member." The agency intended these definitions to be general in order to better ensure a generic standard appropriate to any type of non-pneumatic tire. These definitions were patterned after analogous definitions in NHTSA's safety standard for pneumatic tires and SAE Recommended Practice J328a, "Wheels—Passenger Cars—Performance Requirements and Test Procedures."

The agency received two comments about the proposed definitions. Michelin requested that the definition of a "non-pneumatic spare tire assembly," which was defined as a device "intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car . . .," be revised to state that the NPSTA be "in support of" as well as "in place of." According to the commenter, this modification would allow future NPSTAs to be fitted on tire and wheel assemblies without removing the deflated pneumatic tire. The agency has decided not to adopt Michelin's suggestion which is beyond the scope of the current proposal and its test procedures. Further, the agency needs more information about devices used "in support of" a deflated pneumatic tire, especially about the procedures for testing them while they are mounted on a deflated pneumatic tire. Therefore, NHTSA has decided not to expand the definition as requested by Michelin.

Uniroyal suggested that the agency move the definition of "rim" from the definition section (S3) to the requirements section (S4.4). The agency has decided not to adopt this suggestion which is unnecessary and contrary to standard regulatory drafting. The agency notes that it is modifying the definition of "rim" to "non-pneumatic rim" and "test rim" to "non-pneumatic test rim." This change will help to distinguish between conventional rims for pneumatic tires and rims for non-pneumatic tires. The notice adopts this distinction throughout Standards 110, 120, and 129.

Labeling Requirements

The NPRM proposed labeling requirements for non-pneumatic spare tires and tire assemblies in section S6 of Standard No. 110. The proposal specified that the information had to be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" and not be smaller than a given size. The proposal explained that it was proposing to allow different methods of permanent marking in addition to molding, the labeling method required in Standard No. 109, because it might be difficult to mold the required information into or onto some non-pneumatic tire and assembly designs. It also proposed that the labeling on each non-pneumatic spare tire would state "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation(s) of the pneumatic tire(s) that the non-pneumatic tire was intended to replace. This notice will respond separately to each of the commenters concerns.

Uniroyal requested the agency to modify the requirement that non-pneumatic spare tires be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" to allow a permanently affixed label to contain the required information. It specifically stated that paper or plastic labels should be allowed as an alternative

technique to comply with S6. NHTSA notes that the key criteria related to informational marking requirements is that the message be useful and understandable for the lifetime of the tire. Thus, a message must be permanent, legible, and conspicuous. After reviewing Uniroyal's request, the agency believes that affixing a permanent label on a non-pneumatic tire would not meet these ends. The agency is concerned that a paper label would not be permanent given that it would be exposed to environmental factors such as rain, snow, road salt, car wash brushes and detergents. The agency is especially concerned that there is nothing to prevent a paper label from disintegrating when exposed to the elements or being rubbed off by a curb. Similarly, there is nothing to prevent the printing on the label from becoming illegible. The agency therefore has decided not to permit a label as an alternative technique to comply with S6.

Section S6(a) contained a proposal that each non-pneumatic spare tire be labeled "FOR TEMPORARY USE ONLY." The NPRM explained that this mandatory warning would be in the interest of motor vehicle safety by encouraging the limited use of non-pneumatic tires as a replacement for T-type temporary spare tires. The agency further believed such labeling would provide consumers with valuable guidance about this new type of tire. All commenters mentioning the proposal to require temporary use labeling agreed that it had merit given the current level of technology and agreed that the extended use of a non-pneumatic tire would be inappropriate.

Section S6(b) contained a proposal that each non-pneumatic spare tire be labeled "MAXIMUM 50 M.P.H." The NPRM stated that this maximum speed warning, like the temporary use warning, would be in the interest of safety. The notice further explained that the Economic Commission for Europe (ECE) Regulation 64 contains a maximum speed warning of 80 kilometers per hour (49.7 m.p.h.) in response to concerns over the potential for some degradations in the braking and handling performance of a vehicle fitted with a temporary spare tire. The notice continued that even though these concerns did not directly relate to a tire's structural failure, the agency believed that a maximum speed warning would improve the total safety of the vehicle because any potential problems associated with handling, control, stability, and braking are typically exacerbated at faster speeds. It also stated that a maximum speed warning would serve to deter some motorists from driving with a non-pneumatic tire on an extended basis.

NHTSA received four comments on the proposal to require a maximum speed warning of 50 m.p.h. While Goodyear and Firestone supported the proposal, Uniroyal and General Motors opposed it, stating that it should be at the discretion of the vehicle manufacturer, the entity responsible for the vehicle's braking, handling, and other performance characteristics. Uniroyal stated that such a requirement is unnecessary since T-type pneumatic spares are not required to have such labeling. It also commented that the maximum speed labeling in ECE Regulation 64 is inapplicable to the non-pneumatic spare, since the non-pneumatic tire would be subject to more stringent performance requirements. GM commented that a maximum speed labeling requirement was not warranted, stating that "there is no generic technical or safety reason for it," a non-pneumatic spare tire is not different from current temporary compact spare tires, the maximum recommended speed of 50 m.p.h. might unduly alarm some drivers, and consumers might misinterpret the "50 *m.p.h.* speed" label as a "50 *mile* use" restriction.

After reviewing the maximum speed labeling requirement in light of these comments, NHTSA continues to believe that such a requirement would be in the interest of safety. The agency notes that according to information provided by Uniroyal, there are some differences in performance characteristics between non-pneumatic spare tires and pneumatic spares. For instance, the non-pneumatic tire tends to "nibble," i.e., generate lateral forces when crossing a longitudinal road irregularity. While differences with conventional pneumatic spare tires are not significant enough to justify a prohibition of non-pneumatic tires, these relative shortcomings, which might alarm a driver unfamiliar with them, appear to be exacerbated at greater speeds. Until more experience is gained with non-pneumatic tires, the agency believes that GM's claim that there is no safety reason to justify maximum speed labeling is premature. The agency notes that GM included a 50 m.p.h. maximum speed marking on its pneumatic temporary spare tire for the first five years after its introduction, suggesting that a newly introduced temporary tire design should contain such a maximum speed warning. Based on the above considerations, the agency concludes that to satisfy the Vehicle Safety Act's mandate, the 50 m.p.h. maximum speed marking must be a mandatory requirement and not be left to the manufacturers' discretion.

Section S6(c) of Standard No. 110 contained a proposal that the non-pneumatic tire be labeled with the "size designation(s) of the pneumatic tires that this non-pneumatic tire spare assembly is intended to replace or, at the manufacturer's option, is capable of replacing." All those who commented on this provision opposed it, stating that the requirement could result in lengthy information that might confuse consumers. For instance, a consumer might mistakenly conclude that a 15 inch non-pneumatic

tire could replace any 15 inch pneumatic tire. They claimed that this incorrect assumption could be dangerous given the potential for many vehicle specific non-pneumatic tire and tire assembly designs. In place of this proposal, Uniroyal, Firestone, and GM suggested that the tires be labeled with a vehicle manufacturer's part number, with GM recommending a "non-pneumatic spare tire identifying code" (e.g., "ABC") as an alternative. The State of Connecticut recommended that the non-pneumatic spare tire be labeled to indicate specifically the vehicle(s) on which it is intended to be used. In contrast, Goodyear and Uniroyal criticized requiring vehicle specific marking, stating that the labeling on a tire with multiple vehicle applications could be lengthy, confusing, and thus possibly dangerous.

After reviewing these comments, NHTSA has determined that instead of designations of the pneumatic tires replaced, a "non-pneumatic tire identifying code (NPTIC)" should be required to identify a non-pneumatic tire. Like the tire size designation of a pneumatic tire, the NPTIC's purpose is to provide consumers information about the proper application of a non-pneumatic tire. The agency believes that this method of identification is superior to requiring a non-pneumatic tire to be labeled with the pneumatic tire size or the non-pneumatic spare tire's specific vehicle application(s) given the potential for many different non-pneumatic tire designs. A manufacturer may still mark specific vehicle application(s) on the tire provided that the additional information did not obscure or confuse the required information. Manufacturers are urged, therefore, to avoid unnecessarily long vehicle application information or unnecessarily long identifying codes. Based on the above considerations, the manufacturer will be required to label a non-pneumatic spare tire or spare tire assembly with a "non-pneumatic tire identification code," (NPTIC), which is defined in section S3 of Standard 129. A manufacturer also is required to place the NPTIC on the vehicle placard and in the owner's manual. In addition, the NPTIC will replace any reference in the regulatory text to the "non-pneumatic tire size designation."

Vehicle Placarding

Section S7 of the Standard No. 110 contained proposed requirements for vehicle placards. Under the proposal, the placard would state, in letters not less than 1.0 inch high, "CAUTION—USE AS SPARE TIRE," and in letters not less than 0.5 inches high, "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation of the pneumatic tire to be replaced. The agency believed that this information would help explain that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time.

Volkswagen commented that the size of the lettering proposed in S7.1 would result in a placard that was too large to easily fit in the trunk. Thus, it requested that the standard require the words to be "legible and conspicuous," or in the alternative, to change the 1.0 inch requirement to ⅜ inch and the ½ inch requirement to ¼ inch. NHTSA rejects the first suggestion because the Vehicle Safety Act requires its requirements to be stated in objective terms. However, it has decided to adopt the requested size reductions which the agency believes will be less intrusive but still conspicuous.

GM and Uniroyal opposed the vehicle placarding requirements as being unnecessary and costly. GM based its opposition to these requirements on its earlier arguments against the labeling requirements. NHTSA believes that the placarding requirements are necessary for the reasons provided in support of the labeling requirements in S6. The agency also disagrees that placarding would be unreasonably costly, especially since most vehicle trunks currently contain a placard explaining the use of jacks and spare tires. The information required by this provision could be easily added to that placard. Even for a vehicle without such a placard, the cost of adding a placard would be minimal.

Uniroyal claimed that the words "Danger" and "Caution" might unduly alarm consumers. NHTSA notes that the placard's purpose is to ensure that a person installing a non-pneumatic spare tire on a vehicle is made aware of its proper use and that it should be used only as a spare tire, even if he or she fails to notice the labeling on the tire itself. Because the word "caution" is not essential to this purpose and some consumers might be unduly alarmed by this word, the agency is modifying the placard to state "IMPORTANT—USE OF SPARE TIRE" rather than "CAUTION—USE OF SPARE TIRE."

Supplementary Information

Section S7.2 of Standard No. 110 proposed that the owner's manual of a passenger car equipped with a non-pneumatic spare tire contain information explaining its proper use. This information, which was patterned after ECE Regulation 64, included instructions that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time, that the driver should drive with caution when using a non-pneumatic tire, that he or she should replace it with a pneumatic tire and rim as soon as possible, and that a vehicle should not be operated with more than one non-pneumatic tire at one time.

Uniroyal and GM objected to the proposal to require an owner's manual to contain information

about a non-pneumatic tire's use. Uniroyal restated its view that non-pneumatic tires should not be singled out for informational requirements with which pneumatic spare tires are not required to comply. GM stated that requiring warnings on the tire, on a placard, and in the owner's manual was a "costly redundancy" that would discourage the use of such tires.

NHTSA continues to believe that the requirements in S7.2 provide valuable safety information about non-pneumatic tires, a new type of tire design with which consumers will be less familiar than temporary pneumatic tires. As for GM's criticism that this requirement would result in a "costly redundancy," the agency believes that requiring the safety information to appear in each of the proposed locations provides a safety benefit. It is reasonable to label the tire since a motorist must handle the tire itself before installing it on the vehicle. It is also reasonable to require the information on a placard in the trunk near where the spare tire is stored, because a motorist may not notice the information on the tire, especially at night or during inclement weather. Similarly, it is reasonable to supplement these brief messages with more detailed information in the owner's manual, since a motorist typically consults his or her owner's manual when seeking detailed information about vehicle usage.

In response to GM's concern that these warnings might discourage motorists from using non-pneumatic tires, the agency has modified some of the wording. As with the placard's wording, the agency has substituted the word "IMPORTANT" for "CAUTION" to make the label less threatening. It has also changed S7.2(b) to state "An instruction to drive carefully when the non-pneumatic tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity." The agency believes that this wording will continue to convey guidance concerning the proper use of non-pneumatic tires while helping to avoid arousing "undue concern."

B. *Standard No. 129*

Application

The agency proposed in section S2 of Standard No. 129 that the new standard apply to "new temporary spare non-pneumatic tires for use on passenger cars." In other words, the proposal, in conjunction with the proposed amendment to Standard No. 110, would permit a non-pneumatic tire to be used as a spare tire on passenger cars. The NPRM explained that the petitioner only sought to allow non-pneumatic tires as a replacement for T-type pneumatic temporary tires on passenger cars. It further noted that 95 percent of T-type tires were used on passenger cars with the remaining 5 percent on light trucks. The agency requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109.

No commenter supported limiting the use of non-pneumatic tires to passenger cars. Instead, Chrysler, Goodyear, Uniroyal, RMA, Firestone, and GM commented that the agency should extend the applicability of Standard No. 129 to permit use of non-pneumatic spare tires on light trucks and similar vehicles that use passenger car temporary tires. For instance, Uniroyal stated that the agency should not restrict the non-pneumatic spare tire to passenger cars given that many new light trucks and vans are equipped with passenger car tires.

NHTSA agrees with the comments and has decided to permit the use of a non-pneumatic spare tire on any vehicle that is equipped with passenger car tires. Accordingly, the agency is revising section S5.1.1 to permit the use of a non-pneumatic temporary spare tire assembly on vehicles subject to Standard No. 120 such as light trucks provided that the vehicle is equipped with passenger car tires. In addition, amendments, like those to Standard No. 110, are made to Standard No. 120 to include new informational requirements for tire labeling, vehicle placarding, and the owner's manual.

Definitions

Commenters made suggestions to modify certain proposed definitions. Firestone recommended that the portion of the definition for "non-pneumatic tire" stating that the tire "does not rely on the containment of any gas or fluid" be changed to state that the tire "does not *primarily*" rely on such containment (emphasis added). NHTSA has decided to reject Firestone's suggestion and adopt the definition as proposed because the suggested change would inject uncertainty about whether a tire should be classified as pneumatic or non-pneumatic. For instance, it might be ambiguous whether a pneumatic tire with "run-flat" capability is a non-pneumatic tire under Firestone's suggested definition.

Goodyear, Uniroyal, and RMA suggested that the definition for "tread" be changed by deleting reference to the tread's being "intended to wear away during normal use of the tire." NHTSA agrees with this suggestion which will make the definition for "tread" in Standard No. 129 consistent with the one in Standard No. 109.

Uniroyal suggested that the definition for "maximum tire width," should be changed so that it uses the phrase "exterior edges" in place of "outer and inner surfaces" which appears in reference to

"carcass" and "tread." The agency has decided to adopt the suggested wording which it believes provides a more generic and thus more appropriate definition.

The agency is introducing a definition for "non-pneumatic tire identification code (NPTIC)" in response to comments that a non-pneumatic tire should not be labeled with the size of the pneumatic tire it is intended to replace, but should be labeled with other identifying information. In the section above about labeling requirements, the notice explains that the agency agrees with the commenters that the NPTIC would be in the interests of safety. The reader should refer to that section for a more extensive discussion of this issue.

As discussed earlier, the terms "rim" and "test rim" have been changed to "non-pneumatic rim" and "non-pneumatic test rim." This will help distinguish between rims used with pneumatic tires and those used with non-pneumatic tires. Corresponding changes have been made throughout the regulatory text.

Performance Requirements and Testing Procedures in Standard No. 129

General Considerations

The NPRM proposed certain performance requirements and testing procedures for non-pneumatic tires. In developing a proposed standard for non-pneumatic tires, the agency reviewed the petition, the docket comments responding to the agency's request for comments, and the purpose for and mechanics of the requirements and tests for pneumatic tires in Standard No. 109. As a result of this analysis, the agency proposed the following requirements which it believed would ensure the safety of non-pneumatic tires. These included a lateral strength requirement instead of Standard No. 109's bead unseating requirement; and requirements for strength (in vertical loading), tire endurance, and high speed performance with modifications to take into account a non-pneumatic tire's lack of air pressure. The agency also proposed requirements related to the non-pneumatic tire assembly's size and construction, load rating, and a tread wear indicator. NHTSA tentatively concluded that the lateral strength, strength (in vertical loading), endurance, and high speed requirements would assure the structural integrity and durability of a non-pneumatic tire. The agency further believed that these performance requirements together with the proposed labeling requirements explaining that a non-pneumatic tire should be used only as a temporary spare tire and at limited speeds would assure their safety. Therefore, it decided not to propose additional tests beyond those equivalent to the ones in Standard No. 109. The agency's consideration of comments addressing these factors will be discussed separately.

Lateral Strength Performance Requirements

Section S4.2.2.3 of Standard No. 129 proposed requirements related to the lateral strength of a non-pneumatic tire. Such a tire would be required to show no visual evidence of tread or carcass separation, cracking, or chunking at forces comparable to those specified in Standard No. 109's bead unseating test for compact temporary pneumatic tires. The agency explained that the bead unseating test is intended, in part, to evaluate the loss of air of a tubeless pneumatic tire. In that regard, it would not be helpful in evaluating the lateral strength of a non-pneumatic tire. Nevertheless, because the bead unseating test also evaluates a pneumatic tire's resistance to lateral forces, the agency believed that a comparable test for non-pneumatic tires would be beneficial in determining their structural integrity.

The NPRM explained that GM, in its petition, recommended adopting the same test device used in the bead unseating test of pneumatic tires in Standard No. 109. The agency rejected this recommended test fixture because the unseating "blocks" might be inappropriate for other non-pneumatic tire designs and thus would be too specific to be included in a generic standard. Instead, the agency proposed a lateral strength test device that it believed was generic and appropriate for any anticipated non-pneumatic tire design. The proposed test block was patterned after a standard barrier type curb defined by the American Association of State Highway and Transportation Officials (AASHTO) in its publication, "A Policy on Geometric Design of Highways and Streets—1984." The proposed test was intended to evaluate the strength of a non-pneumatic tire in response to loads that would result from contact with a curb or similar road feature. The agency sought comments concerning the design of the proposed test device, test procedure, and performance requirements intended to evaluate the lateral strength of non-pneumatic tires.

Goodyear requested that the non-pneumatic tires not be subject to a lateral strength test, claiming that such a test was unnecessary and inappropriate. It also claimed that the intent of Standard No. 109's bead unseating test is solely "air retention," as evidenced by its application to tubeless but not tubed pneumatic tires.

NHTSA disagrees with Goodyear's comments and believes that the lateral strength requirement will effectively measure a non-pneumatic tire's resistance to lateral loads. The agency believes that this test will also help evaluate the possibility of the tire's separation from the rim or wheel center mem-

ber or the tire's "cracking," "chunking," or similar damage. The agency notes that the reason that Standard No. 109's bead unseating test is applied to tubeless tires only is because that failure mode is unique to tubeless pneumatic tires. Thus, its application to tubed pneumatic tires would be unnecessary and inappropriate.

Uniroyal, RMA, and Firestone each recommended that the lateral test force block be made lighter and smaller to make testing easier and safer. The lateral force test block shown in Figure 2 and referenced in S5.2, would have weighed 120 pounds and have been 6.5 inches in height, 14 inches in depth and 18 inches in width. Uniroyal commented that the block's depth could be reduced by 7 inches which would reduce the block's weight by over 50 percent. Firestone stated that the width should be retained to ensure that the test block would envelop the side wall of each tire.

After reviewing these comments, NHTSA believes that the test block size can be reduced to facilitate testing without adversely affecting the test procedure's effectiveness. In particular, the agency is adopting Uniroyal's recommendation to reduce the depth by 7 inches by removing 3½ inches from each end of the block and to reduce the height by removing one inch from the bottom of the block. After reviewing Firestone's concerns about the block's "envelopment" of a non-pneumatic spare tire, the agency concludes that it is necessary to widen the test block to 23 inches. The agency calculates that these changes will reduce the test block's weight to approximately 55 pounds, a 53 percent reduction.

Section S5.2 of the NPRM also proposed test requirements related to a non-pneumatic tire's lateral strength. Section S5.2.2.1 specified distances between the test block and the tire being tested. Uniroyal recommended that the agency add another distance expressed as "B = A − 1," explaining that without this modification certain tires would not pass the proposed requirement due to immediate contact with the wheel rim or other member. Thus, in anticipation of future non-pneumatic tire designs with a section height of less than 2 inches above the wheel rim or center member, the agency is including the additional distance requested by Uniroyal.

Vertical Strength Requirements

NHTSA proposed a strength test in S5.3 of Standard No. 129 that was intended to measure the tire's ability to resist concentrated vertical loads. The proposed test would have required a cylindrical steel plunger to be forced into the non-pneumatic tire at a rate of two inches per minute. The tester would then have evaluated the breaking energy for each test point in terms of inch pounds.

In the NPRM, the agency considered also proposing a "cleat" test, like the one suggested in GM's petition, which would have required a non-pneumatic tire to withstand a load exerted by a "cleat." This "cleat" would be ½ inch thick with the edge, that is forced against the tread of the non-pneumatic tire, rounded with ¼ inch radius, and the "cleat" would be one inch wider than the non-pneumatic tire's tread width. The agency tentatively rejected the cleat device because it believed that the plunger test would better simulate real world hazards and because the petitioner did not provide sufficient documentation in support of its test device. The agency expressly requested comments on both the plunger test and the cleat test.

Goodyear provided extensive comments in opposition to any vertical strength test requirement. It argued that the main concern addressed by the "tire strength" requirement in Standard No. 109 is puncture resistance (i.e., the integrity of the air chamber in resistance to vertical forces exerted by nails and similar penetrating objects). It believed that such a concern was not applicable to a non-pneumatic tire. Alternatively, Goodyear stated that if a strength test were deemed necessary, then GM's cleat test would be more appropriate because it evaluates a non-pneumatic tire's capability to withstand loading from curbs, potholes, or railroad tracks. While Uniroyal, RMA, Firestone, and GM also stated that the cleat test would be superior to a plunger test, no commenter supported the plunger test.

NHTSA continues to believe that a vertical strength test is necessary to evaluate a non-pneumatic tire's structural integrity. However, after reevaluating the proposal in light of the comments, the agency agrees that a cleat test, similar to the one requested in GM's petition, would better evaluate the real world problems that will most likely cause a non-pneumatic tire to experience a structural failure.

The agency notes that the plunger test used in Standard No. 109 is well suited for evaluating the energy absorbing capability and structural integrity of a pneumatic tire under conditions of maximum deformation. The plunger pushing against the center of the pneumatic tire's tread will deflect the tire to the maximum extent possible before forcing the tire against the rim. However, the cleat test would be inapplicable for a pneumatic tire which would experience a "pneumatic" failure when the tire's sidewall would be pinched against the rim flanges, long before the energy absorbing capability or structural integrity of the tire could be tested adequately.

In contrast, the situation is reversed for non-pneumatic tires. The "concentrated" type of load used in the plunger test could lead to a "puncture" (i.e., penetration by the plunger) of a non-pneumatic tire, but would not lead to a "pneumatic" failure. For

instance, Uniroyal, stated that its non-pneumatic tire continued to perform without any problems after it was "punctured" by several nails. The agency further notes that there is nothing inherent in a non-pneumatic tire's design that would be expected to lead to failure as the result of a particular type of impact. Based on these considerations, the agency believes that a cleat test that places stress on the entire cross section of a non-pneumatic tire appears to better address real world hazards to which such tires would be vulnerable than would a plunger type test.

As for the measurement of a non-pneumatic tire's strength, NHTSA believes that such a tire should be capable of absorbing energy at a level comparable to the pneumatic temporary tires that it is intended to replace. The NPRM proposed in S4.2.2.4 that the appropriate minimum breaking energy would be 1,950 inch pounds for tires with load ratings below 880 pounds and 2,600 inch pounds for tires with load ratings 880 pounds or above.

Uniroyal recommended that S4.2.2.4 be amended so that the minimum breaking energy would be 525 inch pounds for tires with load ratings below 880 pounds and 700 inch pounds for load ratings of 880 pounds or above. After reviewing Uniroyal's extensive comments in support of the reduced energy levels, NHTSA still believes that the proposed levels are appropriate to ensure a non-pneumatic tire's ability to withstand road hazards. The agency notes that the proposed energy levels are more comparable to the energy levels that a pneumatic temporary spare tire is required to withstand. Given the agency's belief that it is appropriate to require the non-pneumatic tires to be capable of absorbing energy at a level comparable to the pneumatic temporary spare tires that they are intended to replace, the agency has decided to adopt the energy levels as proposed rather than to adopt Uniroyal's suggested energy levels. The agency's review of Uniroyal's data further indicates that the higher energy levels will better protect against real world hazards.

After reviewing S4.2.2.4, NHTSA has decided to modify its language related to a non-pneumatic tire's failure. As proposed, this section stated "Each tire shall meet the requirements for minimum breaking energy when tested in accordance with S5.3 to the strength requirements . . . ." Because a non-pneumatic tire is unlikely to "break," the agency has decided to adopt the statement in the petition and express the requirement in terms of "no visual evidence of tread or carcass separation, cracking or chunking." The agency notes that this will be consistent with the requirements for lateral strength, tire endurance, and high speed performance, which are all expressed in this manner. As a result, the title of the table "Breaking Energy" will be changed to "Minimum Energy Level."

Other Performance Requirements

The NPRM proposed requirements for tire endurance in section S4.2.2.5 and high speed performance in Section S4.2.2.6. The proposals, which were patterned after the requirements in Standard No. 109, were intended to determine the structural integrity and durability of the tire under accelerated laboratory conditions. The agency received no comments about these tests and has decided to adopt them as proposed.

In the NPRM, the agency decided not to propose additional performance requirements explaining its tentative conclusion that the proposed requirements together with the labeling requirements would be adequate to ensure motor vehicle safety. In response to the 1987 request for comments, commenters who expressed an opinion on the matter all stated that no additional performance requirements were necessary. Similarly, in response to the NPRM, no commenter recommended requiring additional performance requirements. After reviewing the matter, the agency is reaffirming its tentative conclusion that the performance requirements, as proposed, together with the labeling requirements, will ensure safety and thus is not requiring any additional performance requirements.

Labeling Requirements in Standard 129

As explained earlier in this notice, the agency is adopting new labeling requirements in S6 of Standard No. 110 and S8 of Standard No. 120. The reader should refer to the discussions in earlier sections of this notice about such issues as a label's permanency, information to be provided about the tire's temporary use and maximum speed, and the tire size labeling/non-pneumatic tire identification code.

In addition to those requirements, the NPRM proposed certain other labeling requirements for non-pneumatic tires. Most of these proposed requirements were patterned after the labeling requirements set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and tire identification number.

GM requested that a load rating not be required on a non-pneumatic tire, claiming this information might cause a motorist to use a non-pneumatic spare tire that would be inappropriate for a vehicle. The agency disagrees with the comment, noting that a tire's load rating is a straightforward item of information that has been required on pneumatic tires without confusing consumers. The agency believes this information is necessary for safety because some vehicle owners have been known to increase a

vehicle's load capacity by the addition of "helper springs" or "air shocks" to permit the towing of a trailer. Thus, by not requiring load rating information, the agency would increase the potential for a motorist to unknowingly use a vehicle equipped with the non-pneumatic tire in an unsafe manner.

Uniroyal commented that S4.3(f), which proposed requiring labeling with Part 574's tire identification number, should be amended given that that number refers, in part, to tire size. As the agency noted above in its discussion of tire size designations and the NPTIC, it believes that use of the NPTIC is preferable to use of tire size. While the agency agrees that a change is therefore necessary to reflect the NPTIC, it has decided to accomplish this by amending Part 574 to apply to non-pneumatic spare tire assemblies and by amending 574.5(b) to expressly refer to the NPTIC. Section 574.4, "applicability," and 574.6, "identification mark," are also revised to expressly refer to non-pneumatic tires and tire assemblies.

Tire and Rim/Wheel Center Member Matching Information

Section S4.4 proposed that each manufacturer list information about the rim or wheel center member expected to be used with a non-pneumatic tire. The information would be provided to either NHTSA or a tire and rim standardization organization such as The Tire and Rim Association. The proposal, which was patterned after section S4.4 of Standard No. 109 for pneumatic tires, is intended to ensure the dissemination of information about the proper use of non-pneumatic tires with rims.

Uniroyal recommended changing the first sentence of S4.4 to exempt from the section's requirements, a non-pneumatic spare tire that is an integral part of a non-pneumatic spare tire assembly. The agency agrees that such an exemption is appropriate given that the section's purpose is to provide information about the matching of non-integral tires and rims.

GM suggested adding a provision which would allow the required information to be disseminated by inclusion in the "vehicle manufacturer's service parts publications for the vehicle on which it is to be used." The commenter believed this change would help prevent the agency and manufacturers from being "deluged" with descriptions of non-pneumatic rims and wheel center members. Based on its experience with pneumatic tires, NHTSA has decided to reject GM's suggestion because the proposed requirement, i.e., the submission of this information to the agency or through the industry's standardization organizations, will be a more effective way to disseminate this information.

After reviewing this provision, NHTSA has decided to modify S4.4. to require the submission to include the NPTIC. This modification to require the inclusion of the NPTIC rather than the tire size is a conforming change made to reflect another change addressed earlier in the notice. In addition, the agency notes that it proposed in the definition of "test rim" in S3 to require each tire and rim matching information listing to include the load rating. After further review, the agency has determined that it more appropriate to include this requirement in section S4.4.

IV. *Effective Date*

The NPRM stated that the proposal would become effective 180 days after publication of a final rule in the *Federal Register*. Uniroyal commented that such advance notification is associated with revisions of regulations that affect products already in the marketplace to afford manufacturers time to comply with the changes. Uniroyal then requested that the 180 day period be eliminated or substantially reduced.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. After reviewing the request, NHTSA agrees that there is "good cause" not to require the full 180 day leadin period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers and that the public interest will be served by not delaying the introduction of these alternative tire designs. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, the agency is amending Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars,* and is establishing Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* in Title 49 of the Code of Federal Regulations at Part 571 as follows:

§571.110 [Amended]

1. Paragraph S2 of Standard 110 is revised to read as follows:

S2 *Application.* This standard applies to passenger cars and to non-pneumatic spare tire assemblies for use on passenger cars.

2. Paragraph S3 of Standard No. 110 is amended by adding the following definitions in the proper alphabetical location:

"Non-pneumatic rim" is used as defined in §571.129.

"Non-pneumatic spare tire assembly" means a

non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

"Non-pneumatic tire" and "non-pneumatic tire assembly" are used as defined in §571.129.

"Rim" is used as defined in §571.109.

"Wheel center member" is used as defined in §571.129.

* * * * *

3. Paragraph S4.1 of Standard No. 110 is revised to read as follows:

S4.1 *General.* Passenger cars shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* except that passenger cars may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars* and S6 and S8 of this standard. Passenger cars equipped with such an assembly shall meet the requirements of S4.3(e), S5, and S7 of this standard.

* * * * *

4. Paragraph S4.3(c), (d), and (e) is revised to read as follows:

* * * * *

(c) Vehicle manufacturer's recommended cold tire inflation pressure for maximum loaded vehicle weight and, subject to the limitations of S4.3.1, for any other manufacturer-specified vehicle loading condition;

(d) Vehicle manufacturer's recommended tire size designation; and

(e) For a vehicle equipped with a non-pneumatic spare tire assembly, the non-pneumatic tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of §571.129, *New Non-Pneumatic Tires for Passenger Cars.*

* * * * *

5. Standard No. 110 is amended by adding paragraphs S5, S6, S7, and S8 to read as follows:

S5 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S6 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.*

Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S7 *Requirements for Passenger Cars Equipped with Non-Pneumatic Spare Tire Assemblies.*

S7.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the vehicle trunk lid or an equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S6 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S7.2 *Supplementary Information.* The owner's manual of the passenger car shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S6(a) and (b) and in S4.3(e);

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the passenger car is not recommended with more than one non-pneumatic spare tire in use at the same time.

S8 *Non-Pneumatic Rims and Wheel Center Members*

S8.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

S8.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

§571.120 [Amended]

6. Paragraph S3 of Standard 120 is revised to read as follows:

S3 *Application.* This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles.

* * * * *

7. Paragraph S5.1.1 of Standard No. 120 is revised to read as follows:

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* or §571.119, *New Pneumatic Tires for Vehicles Other than Passenger Cars,* and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 with §571.109, or S5.1 of 571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of 571.129, *New Non-Pneumatic Tires for Passenger Cars,* and S8 and S10 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.6, S7, and S9 of this standard.

8. The introductory text of paragraph S5.3.2 of Standard No. 120 is revised to read as follows:

S5.3.2 *Vehicles Manufactured on or after December 1, 1984.* Each vehicle manufactured on or after December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5, and in the case of a vehicle equipped with a non-pneumatic spare tire, also that specified in S5.3.6, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

* * * * *

9. Paragraph S5.3.6 is added to Standard No. 120 to read as follows:

S5.3.6 The non-pneumatic tire identification code, with which that assembly is labeled pursuant to S4.3(a) of §571.129.

10. Standard 120 is amended by adding paragraphs S7, S8, S9, and S10.

S7 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S8 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S9 *Requirements for Vehicles Equipped with Non-Pneumatic Spare Tire Assemblies*

S9.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the spare tire stowage area or equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S8 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S9.2 *Supplementary Information.* The owner's manual of the vehicle shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S8(a) and (b) and in S5.3.6;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the vehicle is not recommended with more than one non-pneumatic spare tire in use at the same time.

S10 *Non-Pneumatic Rims and Wheel Center Members*

S10.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

S10.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

11. Part 571 is amended by the addition of 49 CFR §571.129 which would read as follows:

§571.129 Standard No. 129; *New Non-Pneumatic Tires for Passenger Cars.*

S1 *Scope.* This standard specifies tire dimensions and laboratory test requirements for lateral strength, strength, endurance, and high speed performance; defines the tire load rating; and specifies labeling requirements for non-pneumatic spare tires.

S2 *Application.* This standard applies to new temporary spare non-pneumatic tires for use on passenger cars.

S3 *Definitions.*

"Carcass" means the tire structure except for the tread which provides the major portion of the tire's capability to deflect in response to the vertical loads and tractive forces that the tire transmits from the roadway to the non-pneumatic rim, the wheel center member, or the vehicle and which attaches to the vehicle or attaches, either integrally or separably, to the wheel center member or non-pneumatic rim.

"Carcass separation" means the pulling away of the carcass from the non-pneumatic rim or wheel center member.

"Chunking" means the breaking away of pieces of the carcass or tread.

"Cracking" means any parting within the carcass, tread, or any components that connect the tire to the non-pneumatic rim or wheel center member and, if the non-pneumatic tire is integral with the non-pneumatic rim or wheel center member, any parting within the non-pneumatic rim, or wheel center member.

"Load rating" means the maximum load a tire is rated to carry.

"Maximum tire width" means the greater of either the linear distance between the exterior edges of the carcass or the linear distance between the exterior edges of the tread, both being measured parallel to the rolling axis of the tire.

"Non-pneumatic rim" means a mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

"Non-pneumatic test rim" means, with reference to a tire to be tested, any non-pneumatic rim that is listed as appropriate for use with that tire in accordance with S4.4.

"Non-pneumatic tire" means a mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle, and does not rely on the containment of any gas or fluid for providing those functions.

"Non-pneumatic tire assembly" means a non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

"Non-pneumatic tire identification code" means an alphanumeric code that is assigned by the manufacturer to identify the tire with regard to its size, application to a specific non-pneumatic rim or wheel center member, or application to a specific vehicle.

"Test wheel center member" means, with reference to a tire to be tested, any wheel center member that is listed as appropriate for use with that tire in accordance with S4.4.

"Tread" means that portion of the tire that comes in contact with the road.

"Tread separation" means the pulling away of the tread from the carcass.

"Wheel" means a mechanical device which consists of a non-pneumatic rim and wheel center member and which, in the case of a non-pneumatic tire assembly incorporating a wheel, provides the connection between the tire and the vehicle.

"Wheel center member" means, in the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle.

S4 *Requirements.*

S4.1 *Size and Construction.* Each tire shall be designed to fit each non-pneumatic rim or wheel center member specified for its non-pneumatic tire identification code designation in a listing in accordance with section S4.4.

S4.2 *Performance Requirements*

S4.2.1 *General.* Each tire shall conform to the following:

(a) Its load rating shall be that specified in a submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for its non-pneumatic tire identification code designation.

(b) It shall incorporate a tread wear indicator that

will provide a visual indication that the tire has worn to a tread depth of 1/16 inch.

(c) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high speed performance procedure specified in S5.5, exhibit no visual evidence of tread or carcass separation, chunking or cracking.

(d) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 tires.

S4.2.2 *Test Requirements.*

S4.2.2.1 *Test Sample.* For each test sample use:

(a) One tire for physical dimensions, lateral strength, and strength in sequence;

(b) A second tire for tire endurance; and

(c) A third tire for high speed performance.

S4.2.2.2 *Physical Dimensions.* For a non-pneumatic tire assembly in which the tire is separable from the non-pneumatic rim or wheel center member, the dimensions, measured in accordance with S5.1, for that portion of the tire that attaches to that non-pneumatic rim or wheel center member shall satisfy the dimensional specifications contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S4.2.2.3. *Lateral Strength.* There shall be no visual evidence of tread or carcass separation, cracking or chunking, when a tire is tested in accordance with S5.2 to a load of:

(a) 1,500 pounds for tires with a load rating less than 880 pounds;

(b) 2,000 pounds for tires with a load rating of 880 pounds or more but less than 1,400 pounds.

(c) 2,500 pounds for tires with a load rating of 1,400 pounds or more, using the load rating marked on the tire or tire assembly.

S4.2.2.4 *Tire Strength.* There shall be no visual evidence of tread carcass separation, cracking or chunking, when a tire is tested in accordance with S5.3 to a minimum energy level of:

Load Rating	*Minimum Energy Level*
Below 880 pounds	1,950 inch pounds
880 pounds and above	2,600 inch pounds

S4.2.2.5 *Tire Endurance.* When the tire has been subjected to the laboratory endurance test specified in S5.4, using, if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.2.2.6 *High Speed Performance.* When the tire has been subjected to the laboratory high speed performance test specified in S5.5, using if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.3 *Labeling Requirements.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides of the tire or tire assembly in letters or numerals not less than 0.078 inches high, the information shown in paragraphs S4.3(a) through (f). Except, in the case of a non-pneumatic tire assembly of which one side always must face outward when mounted on a vehicle, the information shown in paragraphs S4.3(a) through (f) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in S4.4 of this standard or in 49 CFR §571.110 or 49 CFR §571.120.

(a) The non-pneumatic tire identification code.

(b) Load rating, which, if expressed in kilograms, shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole pound;

(c) For a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly, the size and type designation of the non-pneumatic rim or wheel tire assembly that is contained in the submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation;

(d) The name of the manufacturer or brand name;

(e) The symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(f) The tire identification number required by §574.5 of this chapter;

(g) The labeling requirements set forth in S6 of Standard No. 110 (§571.110), or S8 of Standard No. 120 (§571.120).

S4.4 *Non-Pneumatic Tire Identification Code and Non-Pneumatic Rim/Wheel Center Member Matching Information.* For purposes of this standard, S8 of 49 CFR 571.110 and S10 of 49 CFR 571.120, each manufacturer of a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly shall ensure that it provides a listing to the public for each non-pneumatic tire that it produces. The listing shall include the non-pneumatic tire identification code, tire load rating, dimensional specifications and a diagram of the portion of the tire that attaches to the non-pneumatic rim or wheel center member, and a list of the non-pneumatic rims or wheel center members that may be used with that tire. For each non-pneumatic rim or wheel center member included in such a listing, the information provided shall include a size and type designation for the non-pneumatic rim or wheel center member, and dimensional specifications and a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire if the non-pneumatic rim's or portion of the wheel center member's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this section. The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires or, in the case of non-pneumatic tires supplied only as a temporary spare tire on a vehicle, in a document furnished to dealers of vehicles equipped with the tires, to any person upon request, and in duplicate to the Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, DC 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, of at least one of the following organizations:

The Tire and Rim Association

The European Tire and Rim Technical Organization

Japan Automobile Tire Manufacturers' Association, Inc.

Deutsche Industrie Norm

British Standards Institute

Scandinavian Tire and Rim Organization

Tyre and Rim Association of Australia

S5 *Test Procedures.*

S5.1 *Physical Dimensions.* After conditioning the tire at room temperature for at least 24 hours, using equipment with minimum measurement capabilities of one-half the smallest tolerance specified in the listing contained in the submission made by a manufacturer pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation, measure the portion of the tire that attaches to the non-pneumatic rim or the wheel center member. For any inner diameter dimensional specifications, or other dimensional specifications that are uniform or uniformly spaced around some circumference of the tire, these measurements shall be taken at least six points around the tire, or if specified, at the points specified in the listing contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S5.2 *Lateral Strength.*

S5.2.1 *Preparation of the tire.*

S5.2.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.2.1.2 Mount the tire assembly in a fixture as shown in Figure 1 with the surface of the tire assembly that would face outward when mounted on a vehicle facing toward the lateral strength test block shown in Figure 2 and force the lateral strength test block against the tire.

S5.2.2 *Test Procedure.*

S5.2.2.1 Apply a load through the block to the tire at a rate of 2 inches per minute, with the load arm parallel to the tire assembly at the time of engagement and the first point of contact with the test block being the test block centerline shown in Figure 2, at the following distances, B, in sequence, as shown in Figure 1:

B = A − 1 inch
B = A − 2 inches
B = A − 3 inches
B = A − 4 inches
B = A − 5 inches, and
B = A − 6 inches

However, if at any time during the conduct of the test, the test block comes in contact with the non-pneumatic test rim or test wheel center member, the test shall be suspended and no further testing at smaller values of the distance B shall be conducted. When tested to the above procedure, satisfying the requirements of S4.2.2.3 for all values of B greater than that for which contact between the non-pneumatic test rim or test wheel center member and the test block is made, shall constitute compliance to the requirements set forth in S4.2.2.3.

S5.3 *Tire Strength.*

S5.3.1 *Preparation of the Tire.*

S5.3.1.1 If applicable, mount the tire on a non-pneumatic test rim or test wheel center member.

S5.3.1.2 Condition the tire assembly at room temperature for at least three hours.

S5.3.2 *Test Procedures.*

S5.3.2.1 Force the test cleat, as defined in S5.3.2.2, with its length axis (see S5.3.2.2(a)) parallel to the rolling axis of the non-pneumatic tire assembly, and its height axis (see S5.3.2.2(c)), coinciding with a radius of the non-pneumatic tire assembly, into the tread of the tire at five test points equally spaced around the circumference of the tire. At each test point, the test cleat is forced into the tire at a rate of two inches per minute until the applicable minimum energy level, as shown in S4.2.2.4, calculated using the formula contained in S5.3.2.3, is reached.

S5.3.2.2 The test cleat is made of steel and has the following dimensions:

(a) Length of one inch greater than the maximum tire width of the tire.

(b) Width of one-half inch with the surface which contacts the tire's tread having one-quarter inch radius.

(c) Height of one inch greater than the difference between the unloaded radius of the non-pneumatic tire assembly and the minimum radius of the non-pneumatic rim or wheel center member, if used with the non-pneumatic tire assembly being tested.

S5.3.2.3 The energy level is calculated by the following formula:

$$E = \frac{F \times P}{2}$$

where

E = Energy level, inch-pounds;

F = Force, pounds; and

P = Penetration, inches

S5.4 *Tire Endurance.*

S5.4.1 *Preparation of the tire.*

S5.4.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.4.1.2 Condition the tire assembly to 100 ± 5° F. for at least three hours.

S5.4.2 *Test Procedure.*

S5.4.2.1 Mount the tire assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the maximum tire width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's non-pneumatic tire identification code designation.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5° F.

S5.4.2.3 Conduct the test at 50 miles per hour (m.p.h.) in accordance with the following schedule without interruption (the loads for the following periods are the specified percentage of the load rating marked on the tire or tire assembly):

	Percent
4 hours	85
6 hours	90
24 hours	100

S5.4.2.4 Immediately after running the tire the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.5.

S5.5 *High Speed Endurance.*

S5.5.1 After preparing the tire in accordance with S5.4.1, if applicable, mount the tire assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's load rating as marked on the tire or tire assembly.

S5.5.2 Break in the tire by running it for 2 hours at 50 m.p.h.

S5.5.3 Allow to cool to 100 ± 5° F.

S5.5.4 Test at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and 85 m.p.h. for 30 minutes.

S5.5.5 Immediately after running the tire for the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.6.

S6 *Nonconforming tires.* Any non-pneumatic tire that is designed for use on passenger cars that does not conform to all the requirements of this standard, shall not be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose.

* * * * *

12. Figures 1 and 2 are added following the text of Standard No. 129, appearing as follows:

Part 574 [Amended]

13. The first sentence of 574.4 *Applicability* is revised to read as follows:

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires, and new non-pneumatic tires and non-pneumatic tire assemblies for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948.

* * * * *

14. The first sentence of 574.5 *Tire identification requirements* is revised to read as follows:

Each tire manufacturer shall conspicuously label on one sidewall of each tire it manufactures, except tires manufactured exclusively for mileage-contract purchasers, or non-pneumatic tires or non-pneumatic tire assemblies, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number

containing the information set forth in paragraphs (a) through (d) of this section.

* * * * *

15. Section 574.5 is amended by adding the following to the end of the opening paragraph:

* * * * *

Each manufacturer of a non-pneumatic tire or a non-pneumatic tire assembly shall permanently mold, stamp, or otherwise permanently mark into or onto one side of the non-pneumatic tire or non-pneumatic tire assembly a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by the Federal motor vehicle safety standards shall be positioned relative to the tire identification number as shown in Figure 1, and the symbols to be used for the other information are those listed above. The labeling for a non-pneumatic tire or a non-pneumatic tire assembly shall be in the manner specified in Figure 1 and positioned on the non-pneumatic tire or non-pneumatic tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of the non-pneumatic rim or wheel center member designated for use with that non-pneumatic tire in S4.4 of Standard No. 129 (49 CFR 571.129).

16. Section 574.5(b) is amended by adding the following after the opening sentence:

* * * * *

For a new non-pneumatic tire of a non-pneumatic tire assembly, the second group, of not more than two symbols, shall be used to identify the non-pneumatic tire identification code.

* * * * *

17. Section 574.6, *Identification Mark*, is revised to read as follows:

* * * * *

To obtain the identification mark required by 574.5(a), each manufacturer of new or retreaded pneumatic tires, non-pneumatic tires, or non-pneumatic tire assemblies shall apply in writing to "Tire Identification and Recordkeeping," National Highway Traffic Safety Administration, Department of Transportation, Washington, DC 20590, identify itself as a tire manufacturer or retreader and furnish the following information:

(a) The name, or other designation identifying the applicant, and its main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., pneumatic tires for passenger cars, buses, trucks, or motorcycles; pneumatic retreaded tires; or non-pneumatic tires or non-pneumatic tire assemblies.

Issued on July 12, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 29581
July 20, 1990

Figure 1

Figure 2

MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

S1. Scope. This specifies tire and rim selection requirements and rim marking requirements.

S2. Purpose. The purpose of this standard is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size and type designation.

S3. Application. [This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

S4. Definitions. All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

"Rim base" means the portion of a rim remaining after removal of all split or continuous rim flanges, side rings, and locking rings that can be detached from the rim.

"Rim size designation" means rim diameter and width.

"Rim diameter" means nominal diameter of the bead seat.

"Rim width" means nominal distance between rim flanges.

"Rim type designation" means the industry or manufacturer's designation for a rim by style or code.

"Weather side" means the surface area of the rim not covered by the inflated tire.

S5. Requirements.

S5.1 Tire and rim selection.

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires for highway service shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* or §571.119, *New Pneumatic Tires for Vehicles Other than Passenger Cars,* and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 with §571.109, or S5.1 of 571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of 571.129, *New Non-Pneumatic Tires for Passenger Cars,* and S8 and S10 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.6, S7, and S9 of this standard. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

S5.1.2 Except in the case of a vehicle which has a speed attainable in 2 miles of 50 mph or less, the sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system as specified on the vehicle's certification label required by 49 CFR Part 567. If the certification label shows more than on GAWR for the axle system, the sum shall be not less than the GAWR corresponding to the size designation of the tires fitted to the axle. If the size designation of the tires fitted to the axle does not appear on the certification label, the sum shall be not less than the lowest GAWR appearing on the label. When a tire listed in Appendix A of Standard No. 109 is installed on a multipurpose passenger vehicle, truck, bus, or trailer, the tire's load rating shall be reduced by dividing by 1.10 before calculating the sum.

S5.1.3 In place of tires that meet the requirements of Standard No. 119, a truck, bus, or trailer may at the request of a purchaser be equipped at the place of manufacture of the vehicle with retreaded or used tires owned or leased by the purchaser, if the sum of the maximum load ratings meets the requirements of S5.1.2. Used tires employed under this provision must have been originally manufactured to comply with Standard No. 119, as evidenced by the DOT symbol.

S5.2 Rim marking. On and after August 1, 1977, each rim or, at the option of the manufacturer in the case of a singlepiece wheel, wheel disc shall be marked with the information listed in paragraphs (a) through (e), in lettering not less than one-eighth inch high, impressed to a depth or, at the option of the manufacturer, embossed to a height of not less than 0.005 inch.

The information listed in paragraphs (a) through (c) shall appear on the weather side. In the case of rims of multipiece construction, the information listed in paragraphs (a) through (e) shall appear on the rim base and the information listed in paragraphs (b) and (d) shall also appear on each part of the rim.

(a) A designation which indicates the source of the rim's published nominal dimensions, as follows:

(1) "T" indicates The Tire and Rim Association.

(2) "E" indicates The European Type and Rim Technical Organization.

(3) "J" indicates Japan Automobile Tire Manufacturers Association, Inc.

(4) "D" indicates Deutsche Industrie Norm.

(5) "B" indicates British Standards Institution.

(6) "S" indicates Scandinavian Tire and Rim Organization.

(7) "A" indicates The Tire and Rim Association of Australia.

(8) "N" indicates an independent listing pursuant to S4.4.1(a) of Standard No. 109 or S5.1(a) of Standard No. 119.

(b) The rim size designation, and, in case of multipiece rims, the rim type designation. For example: 20 × 5.50, or 20 × 5.5.

(c) The symbol DOT, constituting a certification by the manufacturer of the rim that the rim complies with all applicable motor vehicle safety standards.

(d) A designation that identifies the manufacturer of the rim by name, trademark, or symbol.

(e) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example,

"September 4, 1976" may be expressed as:

$$90476, \quad \frac{904}{76} \quad \text{or} \quad \frac{76}{904}$$

"September 1976" may be expressed as:

$$976, \quad \frac{9}{76} \quad \text{or} \quad \frac{76}{9}$$

S5.3 Label information. (For vehicles manufactured on and after September 1, 1977) The information specified in S5.3.1 through S5.3.3 shall, in the format set forth following this section, appear either—

(a) After each GAWR listed on the certification label required by §567.4 or §567.5 of this chapter, or at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in §567.4(b) through (f) of Part 567 of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.1 Vehicles manufactured before December 1, 1984. Each vehicle manufactured before December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5 in the format set forth following this section. The information shall appear either—

(a) After each GAWR listed on the certification label required by §567.4 or §567.5 of this chapter; or, at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in §567.4(b) through (f) of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.2 Vehicles manufactured on and after December 1, 1984. [Each vehicle manufactured on or after December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5, and in the case of a vehicle equipped with a non-pneumatic spare tire, also that specified in S5.3.6, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—**(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

(a) After each GAWR listed on the certification label required by §567.4 or §567.5 of this chapter; or, at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in §567.4(b) through (f) of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.3 The size designation of tires (not necessarily those on the vehicle) appropriate (as specified in S5.1.2) for the GAWR.

S5.3.4 The size designation and, if applicable, the type designation of rims (not necessarily those on the vehicle) appropriate for those tires.

S5.3.5 Cold inflation pressure for those tires.

Truck example

Suitable Tire—Rim Choice

GVWR: 17280

GAWR: Front—6280 with 7.50—20(D) tires, 20 × 6.00 rims, at 75 psi cold single.

GAWR: Rear—11000 with 7.50—20(D) tires, 20 × 6.00 rims, at 65 psi cold dual.

GVWR: 17340

GAWR: Front—6300 with 7.00—20(E) tires, 20 × 5.50 rims, at 90 psi cold single.

GAWR: Rear—11040 with 7.00—20(E) tires, 20 × 5.50 rims, at 80 psi cold dual.

[**S5.3.6** The non-pneumatic tire identification code, with which that assembly is labeled pursuant to S4.3(a) of §571.129. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)]**

S6. Vehicles manufactured from September 1, 1976, to February 28, 1977. Notwithstanding any other provision of this standard, a vehicle to which this standard applies that is manufactured during the period from September 1, 1976, to February 28, 1977, shall meet each requirement of this standard, with the following exception: In place of tires that meet Standard No. 119 (§571.119), the vehicle may be equipped with tires that meet every requirement of that standard other than the tire marking requirements of S6.5 of the standard.

[**S7. Load limits for non-pneumatic space tires.** The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S8. Labeling requirements for non-pneumatic spare tires or tire assemblies. Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S9. Requirements for vehicles equipped with non-pneumatic spare tire assemblies.

S9.1 Vehicle placarding requirements. A placard, permanently affixed to the inside of the spare tire stowage area or equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S8 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S9.2 Supplementary information. The owner's manual of the vehicle shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S8(a) and (b) and in S5.3.6;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the vehicle is not recommended with more than one non-pneumatic spare tire in use at the same time.

S10. Non-pneumatic rims and wheel center members.

S10.1 Non-pneumatic rim requirements. Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

S10.2 Wheel center member requirements. Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)]**

41 F.R. 3478
January 23, 1976

PREAMBLE TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 129

New Non-Pneumatic Tires for Passenger Cars (Docket No. 87–12; Notice 3) RIN 2127–AC18

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars,* to permit new passenger cars, multipurpose passenger vehicles, and light trucks equipped with passenger car tires to be equipped with a non-pneumatic spare tire. These standards had required all new vehicles to be equipped with pneumatic tires. The notice also establishes requirements requiring non-pneumatic tires to bear a label stating that the tires are to be used only as a temporary spare tire and only at limited speeds. It requires the manufacturer to place a placard in the vehicle and information in the owner's manual explaining the proper use of these tires. In addition, the notice establishes Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* which includes definitions relevant to non-pneumatic tires and specifies performance, testing, and additional labeling requirements for these tires. In particular, the new standard contains performance requirements related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. The agency has determined that these requirements provide the basic tests to ensure the structural integrity of non-pneumatic tires. To ensure an even higher degree of safety, a non-pneumatic tire must be labeled for use only as a temporary spare tire at limited speeds. NHTSA believes that these performance requirements together with these labels ensure the safety of non-pneumatic tires.

EFFECTIVE DATE: The rule is effective on August 20, 1990.

SUPPLEMENTARY INFORMATION:

I. *General Information*

Federal Motor Vehicle Safety Standard No. 110, *Tire Selection and Rims* (49 CFR §571.110), specifies requirements for the selection of tires to be used on passenger cars. Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars* (49 CFR §571.120), specifies similar requirements for the selection of tires to be used on vehicles other than passenger cars. The purpose of these standards is to prevent tire overloading and to facilitate the proper matching of a tire and rim to a vehicle. They also require a vehicle manufacturer to place in each new vehicle a placard bearing information to ensure use at the proper inflation.

Section S4.1 of Standard No. 110 requires passenger cars to be equipped with tires that meet the requirements of §571.109, "New Pneumatic Tires—Passenger Cars" (49 CFR §571.109). Section S5.1.1 of Standard No. 120 similarly requires vehicles other than passenger cars to be equipped with pneumatic tires that meet the requirements of Standard No. 109 or Standard No. 119 "New Pneumatic Tires for Vehicles Other Than Passenger Cars" (49 CFR §571.119).

Standard No. 109 expressly applies only to new pneumatic tires which it defines as "mechanical device(s) . . . (that) contain the *gas* or fluid that sustains the load" (emphasis added). The standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength (in vertical loading), tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

The practical effect of Standard No. 109's applicability to only pneumatic tires, together with Standard No. 110's requirement that passenger cars must be equipped with tires that meet Standard No. 109's requirements, is to prohibit any new passenger car from being equipped with non-pneumatic tires. Similarly, Standard Nos. 109, 119 and 120 together prohibit any vehicle subject to Standard No. 120 from being equipped with non-pneumatic tires.

A non-pneumatic tire is a mechanical device which serves the same function as a pneumatic tire. That is, it transmits the vertical load and tractive forces from the roadway to the vehicle and generates the tractive forces that provide the directional con-

trol of the vehicle. However, the non-pneumatic tire differs from the pneumatic tire in that the former does not rely on air pressure or the containment of any gas or fluid for providing those functions. A non-pneumatic tire may be designed in many different ways. For instance, it may be solid rubber to which tread is attached; it may be part of an assembly in which the wheel is attached to the tire and tread; or it may contain the tread, tire, rim, and wheel. Further, many different materials may be used in constructing the tire assembly. Because non-pneumatic tires present an emerging technology, it is likely that tire manufacturers may develop new designs and use materials that are currently not known or contemplated.

In view of Standard No. 109's and Standard No. 110's prohibition of tires other than pneumatic tires on motor vehicles, General Motors (GM) petitioned the agency to amend Standard No. 109 to allow non-pneumatic spare tire assemblies for temporary use on passenger cars. The petitioner suggested performance requirements and test conditions for non-pneumatic tires that would address characteristics such as the endurance, high speed performance, strength (in vertical loading), and lateral strength of the non-pneumatic tire. In large part, GM used the existing requirements in Standard No. 109 as a guide for selecting the performance requirements and test conditions for the requested amendment. It changed the requirement and test related to the bead unseating resistance, which specifically relates to pneumatic tires, and also changed the test procedure and strength requirements for the tire's ability to withstand concentrated vertical loads. In addition, GM suggested certain labeling requirements including a warning that the tires would be for temporary use.

GM submitted its petition in connection with its work with Uniroyal Goodrich Co. (Uniroyal) to develop a spare non-pneumatic tire which it intends for only temporary use. The petitioner believes that the agency's adoption of its requested amendment would reduce the weight and size of the spare tires used in passenger cars, resulting in reduced costs, improved reliability and servicability, and minor improvements in fuel economy. Because a non-pneumatic tire is not dependent on air pressure, it would not be subject to problems associated with low inflation pressure such as a blow out or bead unseating during hard cornering.

On September 23, 1987, NHTSA issued a notice announcing the grant of GM's petition and requesting comments about non-pneumatic tires (52 FR 35740). The notice invited comment about what requirements would be necessary to ensure the safe use of a non-pneumatic tire. In response to that notice, NHTSA received comments from various motor vehicle and tire manufacturers as well as the Rubber Manufacturers Association. NHTSA considered each of these comments in developing a notice of proposed rulemaking (NPRM) which it published on April 7, 1989 (54 FR 14109).

II. *Notice of Proposed Rulemaking*

In the NPRM, NHTSA proposed to amend Standard No. 110 to permit the use of non-pneumatic tires on passenger cars, but only as a temporary spare and to establish a new standard for non-pneumatic tires. The notice requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109. As a general proposition, the NPRM explained that in developing the new safety standard, the agency desired to formulate a generic one that would be applicable to as many potential designs of non-pneumatic tires as possible rather than one that was based on a specific design, which might inadvertently restrict future developments and skew innovations toward the initial design.

More specifically, the notice proposed three amendments to Standard No. 110. First, it proposed that section S4.1 be amended to allow passenger cars to be equipped with a non-pneumatic spare tire. Second, the notice proposed that Standard No. 110 contain additional labeling requirements and vehicle placarding requirements explaining that such tires should be used only as a spare tire on a temporary basis at speeds not to exceed 50 m.p.h. Third, the notice proposed that safety information about the use of a non-pneumatic tire be included in the owner's manual of the passenger car.

The proposed new safety standard was Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars.* According to the proposal, the new standard, which was patterned after Standard No. 109, would include definitions relevant to non-pneumatic tires and specify performance requirements, testing procedures, and labeling requirements for these tires. To regulate performance, the new standard would contain performance requirements and tests related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. While the agency considered proposing requirements related to additional factors such as handling and braking, it tentatively determined that the proposed requirements would adequately ensure motor vehicle safety by providing the basic tests necessary to ensure the structural integrity and durability of non-pneumatic tires.

The NPRM also proposed to supplement the labeling requirements in Standard No. 110 by including in Standard No. 129 labeling requirements similar

to those set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and the tire identification number. The notice proposed to allow methods of marking other than "molding," provided the marking was permanent because the agency tentatively concluded that it might be difficult to mold the required information on some types of anticipated non-pneumatic tire designs. The agency also tentatively concluded that the temporary use and maximum speed labeling requirements would provide an extra margin of safety related to handling and braking. In addition, the agency noted that compact pneumatic T-type tires that are currently used as temporary spare tires have been shown to be safe, even though they are not subject to performance requirements beyond those applicable to full size tires in Standard No. 109. The agency believed that in some respects this comparison was relevant since, like the compact T-type pneumatic tires, the non-pneumatic tires allowed by these amendments would be limited to use as temporary spare tires.

The agency tentatively concluded that the proposed performance requirements, together with the proposed labeling requirements, would remove a restriction in the existing standards on technological innovation while still ensuring that the new non-pneumatic tires met the need for safety.

III. *The Comments and the Agency Response*

NHTSA received 13 comments in response to the NPRM. In general, all commenters supported the proposal to permit a vehicle to be equipped with a non-pneumatic spare tire. The agency has considered the points in the comments in developing this final rule. The commenters' significant points are addressed below, along with the agency's response to the comments. For the convenience of the reader, this notice follows the regulatory text's order.

A. *Proposal to Amend Standard No. 110*

Definitions

The NPRM proposed to add definitions to paragraph S3 for "non-pneumatic spare tire assembly," "non-pneumatic tire," "non-pneumatic tire assembly," "rim," and "wheel center member." The agency intended these definitions to be general in order to better ensure a generic standard appropriate to any type of non-pneumatic tire. These definitions were patterned after analogous definitions in NHTSA's safety standard for pneumatic tires and SAE Recommended Practice J328a, "Wheels—Passenger Cars—Performance Requirements and Test Procedures."

The agency received two comments about the proposed definitions. Michelin requested that the definition of a "non-pneumatic spare tire assembly", which was defined as a device "intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car . . .", be revised to state that the NPSTA be "in support of" as well as "in place of." According to the commenter, this modification would allow future NPSTAs to be fitted on tire and wheel assemblies without removing the deflated pneumatic tire. The agency has decided not to adopt Michelin's suggestion which is beyond the scope of the current proposal and its test procedures. Further, the agency needs more information about devices used "in support of" a deflated pneumatic tire, especially about the procedures for testing them while they are mounted on a deflated pneumatic tire. Therefore, NHTSA has decided not to expand the definition as requested by Michelin.

Uniroyal suggested that the agency move the definition of "rim" from the definition section (S3) to the requirements section (S4.4). The agency has decided not to adopt this suggestion which is unnecessary and contrary to standard regulatory drafting. The agency notes that it is modifying the definition of "rim" to "non-pneumatic rim" and "test rim" to "non-pneumatic test rim." This change will help to distinguish between conventional rims for pneumatic tires and rims for non-pneumatic tires. The notice adopts this distinction throughout Standards 110, 120, and 129.

Labeling Requirements

The NPRM proposed labeling requirements for non-pneumatic spare tires and tire assemblies in section S6 of Standard No. 110. The proposal specified that the information had to be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" and not be smaller than a given size. The proposal explained that it was proposing to allow different methods of permanent marking in addition to molding, the labeling method required in Standard No. 109, because it might be difficult to mold the required information into or onto some non-pneumatic tire and assembly designs. It also proposed that the labeling on each non-pneumatic spare tire would state "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation(s) of the pneumatic tire(s) that the non-pneumatic tire was intended to replace. This notice will respond separately to each of the commenters concerns.

Uniroyal requested the agency to modify the requirement that non-pneumatic spare tires be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" to allow a permanently affixed label to contain the required information. It specifically stated that paper or plastic labels should be allowed as an alternative

technique to comply with S6. NHTSA notes that the key criteria related to informational marking requirements is that the message be useful and understandable for the lifetime of the tire. Thus, a message must be permanent, legible, and conspicuous. After reviewing Uniroyal's request, the agency believes that affixing a permanent label on a non-pneumatic tire would not meet these ends. The agency is concerned that a paper label would not be permanent given that it would be exposed to environmental factors such as rain, snow, road salt, car wash brushes and detergents. The agency is especially concerned that there is nothing to prevent a paper label from disintegrating when exposed to the elements or being rubbed off by a curb. Similarly, there is nothing to prevent the printing on the label from becoming illegible. The agency therefore has decided not to permit a label as an alternative technique to comply with S6.

Section S6(a) contained a proposal that each non-pneumatic spare tire be labeled "FOR TEMPORARY USE ONLY." The NPRM explained that this mandatory warning would be in the interest of motor vehicle safety by encouraging the limited use of non-pneumatic tires as a replacement for T-type temporary spare tires. The agency further believed such labeling would provide consumers with valuable guidance about this new type of tire. All commenters mentioning the proposal to require temporary use labeling agreed that it had merit given the current level of technology and agreed that the extended use of a non-pneumatic tire would be inappropriate.

Section S6(b) contained a proposal that each non-pneumatic spare tire be labeled "MAXIMUM 50 M.P.H." The NPRM stated that this maximum speed warning, like the temporary use warning, would be in the interest of safety. The notice further explained that the Economic Commission for Europe (ECE) Regulation 64 contains a maximum speed warning of 80 kilometers per hour (49.7 m.p.h.) in response to concerns over the potential for some degradations in the braking and handling performance of a vehicle fitted with a temporary spare tire. The notice continued that even though these concerns did not directly relate to a tire's structural failure, the agency believed that a maximum speed warning would improve the total safety of the vehicle because any potential problems associated with handling, control, stability, and braking are typically exacerbated at faster speeds. It also stated that a maximum speed warning would serve to deter some motorists from driving with a non-pneumatic tire on an extended basis.

NHTSA received four comments on the proposal to require a maximum speed warning of 50 m.p.h. While Goodyear and Firestone supported the proposal, Uniroyal and General Motors opposed it, stating that it should be at the discretion of the vehicle manufacturer, the entity responsible for the vehicle's braking, handling, and other performance characteristics. Uniroyal stated that such a requirement is unnecessary since T-type pneumatic spares are not required to have such labeling. It also commented that the maximum speed labeling in ECE Regulation 64 is inapplicable to the non-pneumatic spare, since the non-pneumatic tire would be subject to more stringent performance requirements. GM commented that a maximum speed labeling requirement was not warranted, stating that "there is no generic technical or safety reason for it," a non-pneumatic spare tire is not different from current temporary compact spare tires, the maximum recommended speed of 50 m.p.h. might unduly alarm some drivers, and consumers might misinterpret the "50 *m.p.h.* speed" label as a "50 *mile* use" restriction.

After reviewing the maximum speed labeling requirement in light of these comments, NHTSA continues to believe that such a requirement would be in the interest of safety. The agency notes that according to information provided by Uniroyal, there are some differences in performance characteristics between non-pneumatic spare tires and pneumatic spares. For instance, the non-pneumatic tire tends to "nibble," i.e., generate lateral forces when crossing a longitudinal road irregularity. While differences with conventional pneumatic spare tires are not significant enough to justify a prohibition of non-pneumatic tires, these relative shortcomings, which might alarm a driver unfamiliar with them, appear to be exacerbated at greater speeds. Until more experience is gained with non-pneumatic tires, the agency believes that GM's claim that there is no safety reason to justify maximum speed labeling is premature. The agency notes that GM included a 50 m.p.h. maximum speed marking on its pneumatic temporary spare tire for the first five years after its introduction, suggesting that a newly introduced temporary tire design should contain such a maximum speed warning. Based on the above considerations, the agency concludes that to satisfy the Vehicle Safety Act's mandate, the 50 m.p.h. maximum speed marking must be a mandatory requirement and not be left to the manufacturers' discretion.

Section S6(c) of Standard No. 110 contained a proposal that the non-pneumatic tire be labeled with the "size designation(s) of the pneumatic tires that this non-pneumatic tire spare assembly is intended to replace or, at the manufacturer's option, is capable of replacing." All those who commented on this provision opposed it, stating that the requirement could result in lengthy information that might confuse consumers. For instance, a consumer might mistakenly conclude that a 15 inch non-pneumatic

tire could replace any 15 inch pneumatic tire. They claimed that this incorrect assumption could be dangerous given the potential for many vehicle specific non-pneumatic tire and tire assembly designs. In place of this proposal, Uniroyal, Firestone, and GM suggested that the tires be labeled with a vehicle manufacturer's part number, with GM recommending a "non-pneumatic spare tire identifying code" (e.g., "ABC") as an alternative. The State of Connecticut recommended that the non-pneumatic spare tire be labeled to indicate specifically the vehicle(s) on which it is intended to be used. In contrast, Goodyear and Uniroyal criticized requiring vehicle specific marking, stating that the labeling on a tire with multiple vehicle applications could be lengthy, confusing, and thus possibly dangerous.

After reviewing these comments, NHTSA has determined that instead of designations of the pneumatic tires replaced, a "non-pneumatic tire identifying code (NPTIC)" should be required to identify a non-pneumatic tire. Like the tire size designation of a pneumatic tire, the NPTIC's purpose is to provide consumers information about the proper application of a non-pneumatic tire. The agency believes that this method of identification is superior to requiring a non-pneumatic tire to be labeled with the pneumatic tire size or the non-pneumatic spare tire's specific vehicle application(s) given the potential for many different non-pneumatic tire designs. A manufacturer may still mark specific vehicle application(s) on the tire provided that the additional information did not obscure or confuse the required information. Manufacturers are urged, therefore, to avoid unnecessarily long vehicle application information or unnecessarily long identifying codes. Based on the above considerations, the manufacturer will be required to label a non-pneumatic spare tire or spare tire assembly with a "non-pneumatic tire identification code," (NPTIC), which is defined in section S3 of Standard 129. A manufacturer also is required to place the NPTIC on the vehicle placard and in the owner's manual. In addition, the NPTIC will replace any reference in the regulatory text to the "non-pneumatic tire size designation."

Vehicle Placarding

Section S7 of the Standard No. 110 contained proposed requirements for vehicle placards. Under the proposal, the placard would state, in letters not less than 1.0 inch high, "CAUTION—USE AS SPARE TIRE," and in letters not less than 0.5 inches high, "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation of the pneumatic tire to be replaced. The agency believed that this information would help explain that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time.

Volkswagen commented that the size of the lettering proposed in S7.1 would result in a placard that was too large to easily fit in the trunk. Thus, it requested that the standard require the words to be "legible and conspicuous," or in the alternative, to change the 1.0 inch requirement to 3/8 inch and the 1/2 inch requirement to 1/4 inch. NHTSA rejects the first suggestion because the Vehicle Safety Act requires its requirements to be stated in objective terms. However, it has decided to adopt the requested size reductions which the agency believes will be less intrusive but still conspicuous.

GM and Uniroyal opposed the vehicle placarding requirements as being unnecessary and costly. GM based its opposition to these requirements on its earlier arguments against the labeling requirements. NHTSA believes that the placarding requirements are necessary for the reasons provided in support of the labeling requirements in S6. The agency also disagrees that placarding would be unreasonably costly, especially since most vehicle trunks currently contain a placard explaining the use of jacks and spare tires. The information required by this provision could be easily added to that placard. Even for a vehicle without such a placard, the cost of adding a placard would be minimal.

Uniroyal claimed that the words "Danger" and "Caution" might unduly alarm consumers. NHTSA notes that the placard's purpose is to ensure that a person installing a non-pneumatic spare tire on a vehicle is made aware of its proper use and that it should be used only as a spare tire, even if he or she fails to notice the labeling on the tire itself. Because the word "caution" is not essential to this purpose and some consumers might be unduly alarmed by this word, the agency is modifying the placard to state "IMPORTANT—USE OF SPARE TIRE" rather than "CAUTION—USE OF SPARE TIRE."

Supplementary Information

Section S7.2 of Standard No. 110 proposed that the owner's manual of a passenger car equipped with a non-pneumatic spare tire contain information explaining its proper use. This information, which was patterned after ECE Regulation 64, included instructions that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time, that the driver should drive with caution when using a non-pneumatic tire, that he or she should replace it with a pneumatic tire and rim as soon as possible, and that a vehicle should not be operated with more than one non-pneumatic tire at one time.

Uniroyal and GM objected to the proposal to require an owner's manual to contain information

about a non-pneumatic tire's use. Uniroyal restated its view that non-pneumatic tires should not be singled out for informational requirements with which pneumatic spare tires are not required to comply. GM stated that requiring warnings on the tire, on a placard, and in the owner's manual was a "costly redundancy" that would discourage the use of such tires.

NHTSA continues to believe that the requirements in S7.2 provide valuable safety information about non-pneumatic tires, a new type of tire design with which consumers will be less familiar than temporary pneumatic tires. As for GM's criticism that this requirement would result in a "costly redundancy," the agency believes that requiring the safety information to appear in each of the proposed locations provides a safety benefit. It is reasonable to label the tire since a motorist must handle the tire itself before installing it on the vehicle. It is also reasonable to require the information on a placard in the trunk near where the spare tire is stored, because a motorist may not notice the information on the tire, especially at night or during inclement weather. Similarly, it is reasonable to supplement these brief messages with more detailed information in the owner's manual, since a motorist typically consults his or her owner's manual when seeking detailed information about vehicle usage.

In response to GM's concern that these warnings might discourage motorists from using non-pneumatic tires, the agency has modified some of the wording. As with the placard's wording, the agency has substituted the word "IMPORTANT" for "CAUTION" to make the label less threatening. It has also changed S7.2(b) to state "An instruction to drive carefully when the non-pneumatic tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity." The agency believes that this wording will continue to convey guidance concerning the proper use of non-pneumatic tires while helping to avoid arousing "undue concern."

B. *Standard No. 129*

Application

The agency proposed in section S2 of Standard No. 129 that the new standard apply to "new temporary spare non-pneumatic tires for use on passenger cars." In other words, the proposal, in conjunction with the proposed amendment to Standard No. 110, would permit a non-pneumatic tire to be used as a spare tire on passenger cars. The NPRM explained that the petitioner only sought to allow non-pneumatic tires as a replacement for T-type pneumatic temporary tires on passenger cars. It further noted that 95 percent of T-type tires were used on passenger cars with the remaining 5 percent on light trucks. The agency requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109.

No commenter supported limiting the use of non-pneumatic tires to passenger cars. Instead, Chrysler, Goodyear, Uniroyal, RMA, Firestone, and GM commented that the agency should extend the applicability of Standard No. 129 to permit use of non-pneumatic spare tires on light trucks and similar vehicles that use passenger car temporary tires. For instance, Uniroyal stated that the agency should not restrict the non-pneumatic spare tire to passenger cars given that many new light trucks and vans are equipped with passenger car tires.

NHTSA agrees with the comments and has decided to permit the use of a non-pneumatic spare tire on any vehicle that is equipped with passenger car tires. Accordingly, the agency is revising section S5.1.1 to permit the use of a non-pneumatic temporary spare tire assembly on vehicles subject to Standard No. 120 such as light trucks provided that the vehicle is equipped with passenger car tires. In addition, amendments, like those to Standard No. 110, are made to Standard No. 120 to include new informational requirements for tire labeling, vehicle placarding, and the owner's manual.

Definitions

Commenters made suggestions to modify certain proposed definitions. Firestone recommended that the portion of the definition for "non-pneumatic tire" stating that the tire "does not rely on the containment of any gas or fluid" be changed to state that the tire "does not *primarily*" rely on such containment (emphasis added). NHTSA has decided to reject Firestone's suggestion and adopt the definition as proposed because the suggested change would inject uncertainty about whether a tire should be classified as pneumatic or non-pneumatic. For instance, it might be ambiguous whether a pneumatic tire with "run-flat" capability is a non-pneumatic tire under Firestone's suggested definition.

Goodyear, Uniroyal, and RMA suggested that the definition for "tread" be changed by deleting reference to the tread's being "intended to wear away during normal use of the tire." NHTSA agrees with this suggestion which will make the definition for "tread" in Standard No. 129 consistent with the one in Standard No. 109.

Uniroyal suggested that the definition for "maximum tire width," should be changed so that it uses the phrase "exterior edges" in place of "outer and inner surfaces" which appears in reference to

"carcass" and "tread." The agency has decided to adopt the suggested wording which it believes provides a more generic and thus more appropriate definition.

The agency is introducing a definition for "Non-pneumatic tire identification code" (i.e., "NPTIC") in response to comments that a non-pneumatic tire should not be labeled with the size of the pneumatic tire it is intended to replace, but should be labeled with other identifying information. In the section above about labeling requirements, the notice explains that the agency agrees with the commenters that the NPTIC would be in the interests of safety. The reader should refer to that section for a more extensive discussion of this issue.

As discussed earlier, the terms "rim" and "test rim" have been changed to "non-pneumatic rim" and "non-pneumatic test rim." This will help distinguish between rims used with pneumatic tires and those used with non-pneumatic tires. Corresponding changes have been made throughout the regulatory text.

Performance Requirements and Testing Procedures in Standard No. 129

General Considerations

The NPRM proposed certain performance requirements and testing procedures for non-pneumatic tires. In developing a proposed standard for non-pneumatic tires, the agency reviewed the petition, the docket comments responding to the agency's request for comments, and the purpose for and mechanics of the requirements and tests for pneumatic tires in Standard No. 109. As a result of this analysis, the agency proposed the following requirements which it believed would ensure the safety of non-pneumatic tires. These included a lateral strength requirement instead of Standard No. 109's bead unseating requirement; and requirements for strength (in vertical loading), tire endurance, and high speed performance with modifications to take into account a non-pneumatic tire's lack of air pressure. The agency also proposed requirements related to the non-pneumatic tire assembly's size and construction, load rating, and a tread wear indicator. NHTSA tentatively concluded that the lateral strength, strength (in vertical loading), endurance, and high speed requirements would assure the structural integrity and durability of a non-pneumatic tire. The agency further believed that these performance requirements together with the proposed labeling requirements explaining that a non-pneumatic tire should be used only as a temporary spare tire and at limited speeds would assure their safety. Therefore, it decided not to propose additional tests beyond those equivalent to the ones in Standard No. 109. The agency's consideration of comments addressing these factors will be discussed separately.

Lateral Strength Performance Requirements

Section S4.2.2.3 of Standard No. 129 proposed requirements related to the lateral strength of a non-pneumatic tire. Such a tire would be required to show no visual evidence of tread or carcass separation, cracking, or chunking at forces comparable to those specified in Standard No. 109's bead unseating test for compact temporary pneumatic tires. The agency explained that the bead unseating test is intended, in part, to evaluate the loss of air of a tubeless pneumatic tire. In that regard, it would not be helpful in evaluating the lateral strength of a non-pneumatic tire. Nevertheless, because the bead unseating test also evaluates a pneumatic tire's resistance to lateral forces, the agency believed that a comparable test for non-pneumatic tires would be beneficial in determining their structural integrity.

The NPRM explained that GM, in its petition, recommended adopting the same test device used in the bead unseating test of pneumatic tires in Standard No. 109. The agency rejected this recommended test fixture because the unseating "blocks" might be inappropriate for other non-pneumatic tire designs and thus would be too specific to be included in a generic standard. Instead, the agency proposed a lateral strength test device that it believed was generic and appropriate for any anticipated non-pneumatic tire design. The proposed test block was patterned after a standard barrier type curb defined by the American Association of State Highway and Transportation Officials (AASHTO) in its publication, "A Policy on Geometric Design of Highways and Streets—1984." The proposed test was intended to evaluate the strength of a non-pneumatic tire in response to loads that would result from contact with a curb or similar road feature. The agency sought comments concerning the design of the proposed test device, test procedure, and performance requirements intended to evaluate the lateral strength of non-pneumatic tires.

Goodyear requested that the non-pneumatic tires not be subject to a lateral strength test, claiming that such a test was unnecessary and inappropriate. It also claimed that the intent of Standard No. 109's bead unseating test is solely "air retention," as evidenced by its application to tubeless but not tubed pneumatic tires.

NHTSA disagrees with Goodyear's comments and believes that the lateral strength requirement will effectively measure a non-pneumatic tire's resistance to lateral loads. The agency believes that this test will also help evaluate the possibility of the tire's separation from the rim or wheel center mem-

ber or the tire's "cracking," "chunking," or similar damage. The agency notes that the reason that Standard No. 109's bead unseating test is applied to tubeless tires only is because that failure mode is unique to tubeless pneumatic tires. Thus, its application to tubed pneumatic tires would be unnecessary and inappropriate.

Uniroyal, RMA, and Firestone each recommended that the lateral test force block be made lighter and smaller to make testing easier and safer. The lateral force test block shown in Figure 2 and referenced in S5.2, would have weighed 120 pounds and have been 6.5 inches in height, 14 inches in depth and 18 inches in width. Uniroyal commented that the block's depth could be reduced by 7 inches which would reduce the block's weight by over 50 percent. Firestone stated that the width should be retained to ensure that the test block would envelop the side wall of each tire.

After reviewing these comments, NHTSA believes that the test block size can be reduced to facilitate testing without adversely affecting the test procedure's effectiveness. In particular, the agency is adopting Uniroyal's recommendation to reduce the depth by 7 inches by removing 3½ inches from each end of the block and to reduce the height by removing one inch from the bottom of the block. After reviewing Firestone's concerns about the block's "envelopment" of a non-pneumatic spare tire, the agency concludes that it is necessary to widen the test block to 23 inches. The agency calculates that these changes will reduce the test block's weight to approximately 55 pounds, a 53 percent reduction.

Section S5.2 of the NPRM also proposed test requirements related to a non-pneumatic tire's lateral strength. Section S5.2.2.1 specified distances between the test block and the tire being tested. Uniroyal recommended that the agency add another distance expressed as "B = A − 1," explaining that without this modification certain tires would not pass the proposed requirement due to immediate contact with the wheel rim or other member. Thus, in anticipation of future non-pneumatic tire designs with a section height of less than 2 inches above the wheel rim or center member, the agency is including the additional distance requested by Uniroyal.

Vertical Strength Requirements

NHTSA proposed a strength test in S5.3 of Standard No. 129 that was intended to measure the tire's ability to resist concentrated vertical loads. The proposed test would have required a cylindrical steel plunger to be forced into the non-pneumatic tire at a rate of two inches per minute. The tester would then have evaluated the breaking energy for each test point in terms of inch pounds.

In the NPRM, the agency considered also proposing a "cleat" test, like the one suggested in GM's petition, which would have required a non-pneumatic tire to withstand a load exerted by a "cleat." This "cleat" would be ½ inch thick with the edge, that is forced against the tread of the non-pneumatic tire, rounded with ¼ inch radius, and the "cleat" would be one inch wider than the non-pneumatic tire's tread width. The agency tentatively rejected the cleat device because it believed that the plunger test would better simulate real world hazards and because the petitioner did not provide sufficient documentation in support of its test device. The agency expressly requested comments on both the plunger test and the cleat test.

Goodyear provided extensive comments in opposition to any vertical strength test requirement. It argued that the main concern addressed by the "tire strength" requirement in Standard No. 109 is puncture resistance (i.e., the integrity of the air chamber in resistance to vertical forces exerted by nails and similar penetrating objects). It believed that such a concern was not applicable to a non-pneumatic tire. Alternatively, Goodyear stated that if a strength test were deemed necessary, then GM's cleat test would be more appropriate because it evaluates a non-pneumatic tire's capability to withstand loading from curbs, potholes, or railroad tracks. While Uniroyal, RMA, Firestone, and GM also stated that the cleat test would be superior to a plunger test, no commenter supported the plunger test.

NHTSA continues to believe that a vertical strength test is necessary to evaluate a non-pneumatic tire's structural integrity. However, after reevaluating the proposal in light of the comments, the agency agrees that a cleat test, similar to the one requested in GM's petition, would better evaluate the real world problems that will most likely cause a non-pneumatic tire to experience a structural failure.

The agency notes that the plunger test used in Standard No. 109 is well suited for evaluating the energy absorbing capability and structural integrity of a pneumatic tire under conditions of maximum deformation. The plunger pushing against the center of the pneumatic tire's tread will deflect the tire to the maximum extent possible before forcing the tire against the rim. However, the cleat test would be inapplicable for a pneumatic tire which would experience a "pneumatic" failure when the tire's sidewall would be pinched against the rim flanges, long before the energy absorbing capability or structural integrity of the tire could be tested adequately.

In contrast, the situation is reversed for non-pneumatic tires. The "concentrated" type of load used in the plunger test could lead to a "puncture" (i.e., penetration by the plunger) of a non-pneumatic tire, but would not lead to a "pneumatic" failure. For

instance, Uniroyal, stated that its non-pneumatic tire continued to perform without any problems after it was "punctured" by several nails. The agency further notes that there is nothing inherent in a non-pneumatic tire's design that would be expected to lead to failure as the result of a particular type of impact. Based on these considerations, the agency believes that a cleat test that places stress on the entire cross section of a non-pneumatic tire appears to better address real world hazards to which such tires would be vulnerable than would a plunger type test.

As for the measurement of a non-pneumatic tire's strength, NHTSA believes that such a tire should be capable of absorbing energy at a level comparable to the pneumatic temporary tires that it is intended to replace. The NPRM proposed in S4.2.2.4 that the appropriate minimum breaking energy would be 1,950 inch pounds for tires with load ratings below 880 pounds and 2,600 inch pounds for tires with load ratings 880 pounds or above.

Uniroyal recommended that S4.2.2.4 be amended so that the minimum breaking energy would be 525 inch pounds for tires with load ratings below 880 pounds and 700 inch pounds for load ratings of 880 pounds or above. After reviewing Uniroyal's extensive comments in support of the reduced energy levels, NHTSA still believes that the proposed levels are appropriate to ensure a non-pneumatic tire's ability to withstand road hazards. The agency notes that the proposed energy levels are more comparable to the energy levels that a pneumatic temporary spare tire is required to withstand. Given the agency's belief that it is appropriate to require the non-pneumatic tires to be capable of absorbing energy at a level comparable to the pneumatic temporary spare tires that they are intended to replace, the agency has decided to adopt the energy levels as proposed rather than to adopt Uniroyal's suggested energy levels. The agency's review of Uniroyal's data further indicates that the higher energy levels will better protect against real world hazards.

After reviewing S4.2.2.4, NHTSA has decided to modify its language related to a non-pneumatic tire's failure. As proposed, this section stated "Each tire shall meet the requirements for minimum breaking energy when tested in accordance with S5.3 to the strength requirements . . . ." Because a non-pneumatic tire is unlikely to "break," the agency has decided to adopt the statement in the petition and express the requirement in terms of "no visual evidence of tread or carcass separation, cracking or chunking." The agency notes that this will be consistent with the requirements for lateral strength, tire endurance, and high speed performance, which are all expressed in this manner. As a result, the title of the table "Breaking Energy" will be changed to "Minimum Energy Level."

Other Performance Requirements

The NPRM proposed requirements for tire endurance in section S4.2.2.5 and high speed performance in Section S4.2.2.6. The proposals, which were patterned after the requirements in Standard No. 109, were intended to determine the structural integrity and durability of the tire under accelerated laboratory conditions. The agency received no comments about these tests and has decided to adopt them as proposed.

In the NPRM, the agency decided not to propose additional performance requirements explaining its tentative conclusion that the proposed requirements together with the labeling requirements would be adequate to ensure motor vehicle safety. In response to the 1987 request for comments, commenters who expressed an opinion on the matter all stated that no additional performance requirements were necessary. Similarly, in response to the NPRM, no commenter recommended requiring additional performance requirements. After reviewing the matter, the agency is reaffirming its tentative conclusion that the performance requirements, as proposed, together with the labeling requirements, will ensure safety and thus is not requiring any additional performance requirements.

Labeling Requirements in Standard 129

As explained earlier in this notice, the agency is adopting new labeling requirements in S6 of Standard No. 110 and S8 of Standard No. 120. The reader should refer to the discussions in earlier sections of this notice about such issues as a label's permanency, information to be provided about the tire's temporary use and maximum speed, and the tire size labeling/non-pneumatic tire identification code.

In addition to those requirements, the NPRM proposed certain other labeling requirements for non-pneumatic tires. Most of these proposed requirements were patterned after the labeling requirements set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and tire identification number.

GM requested that a load rating not be required on a non-pneumatic tire, claiming this information might cause a motorist to use a non-pneumatic spare tire that would be inappropriate for a vehicle. The agency disagrees with the comment, noting that a tire's load rating is a straightforward item of information that has been required on pneumatic tires without confusing consumers. The agency believes this information is necessary for safety because some vehicle owners have been known to increase a

vehicle's load capacity by the addition of "helper springs" or "air shocks" to permit the towing of a trailer. Thus, by not requiring load rating information, the agency would increase the potential for a motorist to unknowingly use a vehicle equipped with the non-pneumatic tire in an unsafe manner.

Uniroyal commented that S4.3(f), which proposed requiring labeling with Part 574's tire identification number, should be amended given that that number refers, in part, to tire size. As the agency noted above in its discussion of tire size designations and the NPTIC, it believes that use of the NPTIC is preferable to use of tire size. While the agency agrees that a change is therefore necessary to reflect the NPTIC, it has decided to accomplish this by amending Part 574 to apply to non-pneumatic spare tire assemblies and by amending 574.5(b) to expressly refer to the NPTIC. Section 574.4, "applicability," and 574.6, "identification mark," are also revised to expressly refer to non-pneumatic tires and tire assemblies.

Tire and Rim/Wheel Center Member Matching Information

Section S4.4 proposed that each manufacturer list information about the rim or wheel center member expected to be used with a non-pneumatic tire. The information would be provided to either NHTSA or a tire and rim standardization organization such as The Tire and Rim Association. The proposal, which was patterned after section S4.4 of Standard No. 109 for pneumatic tires, is intended to ensure the dissemination of information about the proper use of non-pneumatic tires with rims.

Uniroyal recommended changing the first sentence of S4.4 to exempt from the section's requirements, a non-pneumatic spare tire that is an integral part of a non-pneumatic spare tire assembly. The agency agrees that such an exemption is appropriate given that the section's purpose is to provide information about the matching of non-integral tires and rims.

GM suggested adding a provision which would allow the required information to be disseminated by inclusion in the "vehicle manufacturer's service parts publications for the vehicle on which it is to be used." The commenter believed this change would help prevent the agency and manufacturers from being "deluged" with descriptions of non-pneumatic rims and wheel center members. Based on its experience with pneumatic tires, NHTSA has decided to reject GM's suggestion because the proposed requirement, i.e., the submission of this information to the agency or through the industry's standardization organizations, will be a more effective way to disseminate this information.

After reviewing this provision, NHTSA has decided to modify S4.4. to require the submission to include the NPTIC. This modification to require the inclusion of the NPTIC rather than the tire size is a conforming change made to reflect another change addressed earlier in the notice. In addition, the agency notes that it proposed in the definition of "test rim" in S3 to require each tire and rim matching information listing to include the load rating. After further review, the agency has determined that it more appropriate to include this requirement in section S4.4.

IV. *Effective Date*

The NPRM stated that the proposal would become effective 180 days after publication of a final rule in the *Federal Register*. Uniroyal commented that such advance notification is associated with revisions of regulations that affect products already in the marketplace to afford manufacturers time to comply with the changes. Uniroyal then requested that the 180 day period be eliminated or substantially reduced.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. After reviewing the request, NHTSA agrees that there is "good cause" not to require the full 180 day leadin period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers and that the public interest will be served by not delaying the introduction of these alternative tire designs. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, the agency is amending Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars,* and is establishing Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* in Title 49 of the Code of Federal Regulations at Part 571 as follows:

§571.110 [Amended]

1. Paragraph S2 of Standard 110 is revised to read as follows:

S2 *Application.* This standard applies to passenger cars and to non-pneumatic spare tire assemblies for use on passenger cars.

2. Paragraph S3 of Standard No. 110 is amended by adding the following definitions in the proper alphabetical location:

"Non-pneumatic rim" is used as defined in §571.129.

"Non-pneumatic spare tire assembly" means a

non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

"Non-pneumatic tire" and "non-pneumatic tire assembly" are used as defined in §571.129.

"Rim" is used as defined in §571.109.

"Wheel center member" is used as defined in §571.129.

. . . . .

3. Paragraph S4.1 of Standard No. 110 is revised to read as follows:

S4.1 *General.* Passenger cars shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* except that passenger cars may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars* and S6 and S8 of this standard. Passenger cars equipped with such an assembly shall meet the requirements of S4.3(e), S5, and S7 of this standard.

. . . . .

4. Paragraph S4.3(c), (d), and (e) is revised to read as follows:

. . . . .

(c) Vehicle manufacturer's recommended cold tire inflation pressure for maximum loaded vehicle weight and, subject to the limitations of S4.3.1, for any other manufacturer-specified vehicle loading condition;

(d) Vehicle manufacturer's recommended tire size designation; and

(e) For a vehicle equipped with a non-pneumatic spare tire assembly, the non-pneumatic tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of §571.129, *New Non-Pneumatic Tires for Passenger Cars.*

. . . . .

5. Standard No. 110 is amended by adding paragraphs S5, S6, S7 and S8 to read as follows:

S5 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S6 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.*

Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S7 *Requirements for Passenger Cars Equipped with Non-Pneumatic Spare Tire Assemblies.*

S7.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the vehicle trunk lid or an equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S6 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S7.2 *Supplementary Information.* The owner's manual of the passenger car shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S6(a) and (b) and in S4.3(e);

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the passenger car is not recommended with more than one non-pneumatic spare tire in use at the same time.

S8 *Non-Pneumatic Rims and Wheel Center Members*

S8.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

S8.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

§571.120 [Amended]

6. Paragraph S3 of Standard 120 is revised to read as follows:

S3 *Application.* This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles.

* * * * *

7. Paragraph S5.1.1 of Standard No. 120 is revised to read as follows:

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* or §571.119, *New Pneumatic Tires for Vehicles Other than Passenger Cars,* and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 with §571.109, or S5.1 of §571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars,* and S8 and S10 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.6, S7, and S9 of this standard.

8. The introductory text of paragraph S5.3.2 of Standard No. 120 is revised to read as follows:

S5.3.2 *Vehicles Manufactured on or after December 1, 1984.* Each vehicle manufactured on or after December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5, and in the case of a vehicle equipped with a non-pneumatic spare tire, also that specified in S5.3.6, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

* * * * *

9. Paragraph S5.3.6 is added to Standard No. 120 to read as follows:

S5.3.6 The non-pneumatic tire identification code, with which that assembly is labeled pursuant to S4.3(a) of §571.129.

10. Standard 120 is amended by adding paragraphs S7, S8, S9, and S10.

S7 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S8 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S9 *Requirements for Vehicles Equipped with Non-Pneumatic Spare Tire Assemblies*

S9.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the spare tire stowage area or equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S8 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S9.2 *Supplementary Information.* The owner's manual of the vehicle shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S8(a) and (b) and in S5.3.6;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the vehicle is not recommended with more than one non-pneumatic spare tire in use at the same time.

S10 *Non-Pneumatic Rims and Wheel Center Members*

S10.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

S10.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

* * * *

11. Part 571 is amended by the addition of 49 CFR §571.129 which would read as follows:

§571.129 Standard No. 129; *New Non-Pneumatic Tires for Passenger Cars.*

S1 *Scope.* This standard specifies tire dimensions and laboratory test requirements for lateral strength, strength, endurance, and high speed performance; defines the tire load rating; and specifies labeling requirements for non-pneumatic spare tires.

S2 *Application.* This standard applies to new temporary spare non-pneumatic tires for use on passenger cars.

S3 *Definitions.*

"Carcass" means the tire structure except for the tread which provides the major portion of the tire's capability to deflect in response to the vertical loads and tractive forces that the tire transmits from the roadway to the non-pneumatic rim, the wheel center member, or the vehicle and which attaches to the vehicle or attaches, either integrally or separably, to the wheel center member or non-pneumatic rim.

"Carcass separation" means the pulling away of the carcass from the non-pneumatic rim or wheel center member.

"Chunking" means the breaking away of pieces of the carcass or tread.

"Cracking" means any parting within the carcass, tread, or any components that connect the tire to the non-pneumatic rim or wheel center member and, if the non-pneumatic tire is integral with the non-pneumatic rim or wheel center member, any parting within the non-pneumatic rim, or wheel center member.

"Load rating" means the maximum load a tire is rated to carry.

"Maximum tire width" means the greater of either the linear distance between the exterior edges of the carcass or the linear distance between the exterior edges of the tread, both being measured parallel to the rolling axis of the tire.

"Non-pneumatic rim" means a mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

"Non-pneumatic test rim" means, with reference to a tire to be tested, any non-pneumatic rim that is listed as appropriate for use with that tire in accordance with S4.4.

"Non-pneumatic tire" means a mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle, and does not rely on the containment of any gas or fluid for providing those functions.

"Non-pneumatic tire assembly" means a non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

"Non-pneumatic tire identification code" means an alphanumeric code that is assigned by the manufacturer to identify the tire with regard to its size, application to a specific non-pneumatic rim or wheel center member, or application to a specific vehicle.

"Test wheel center member" means, with reference to a tire to be tested, any wheel center member that is listed as appropriate for use with that tire in accordance with S4.4.

"Tread" means that portion of the tire that comes in contact with the road.

"Tread separation" means the pulling away of the tread from the carcass.

"Wheel" means a mechanical device which consists of a non-pneumatic rim and wheel center member and which, in the case of a non-pneumatic tire assembly incorporating a wheel, provides the connection between the tire and the vehicle.

"Wheel center member" means, in the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle.

S4 *Requirements.*

S4.1 *Size and Construction.* Each tire shall be designed to fit each non-pneumatic rim or wheel center member specified for its non-pneumatic tire identification code designation in a listing in accordance with section S4.4.

S4.2 *Performance Requirements*

S4.2.1 *General.* Each tire shall conform to the following:

(a) Its load rating shall be that specified in a submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for its non-pneumatic tire identification code designation.

(b) It shall incorporate a tread wear indicator that

will provide a visual indication that the tire has worn to a tread depth of $\frac{1}{16}$ inch.

(c) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high speed performance procedure specified in S5.5, exhibit no visual evidence of tread or carcass separation, chunking or cracking.

(d) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 tires.

S4.2.2 *Test Requirements.*

S4.2.2.1 *Test Sample.* For each test sample use:

(a) One tire for physical dimensions, lateral strength, and strength in sequence;

(b) A second tire for tire endurance; and

(c) A third tire for high speed performance.

S4.2.2.2 *Physical Dimensions.* For a non-pneumatic tire assembly in which the tire is separable from the non-pneumatic rim or wheel center member, the dimensions, measured in accordance with S5.1, for that portion of the tire that attaches to that non-pneumatic rim or wheel center member shall satisfy the dimensional specifications contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S4.2.2.3. *Lateral Strength.* There shall be no visual evidence of tread or carcass separation, cracking or chunking, when a tire is tested in accordance with S5.2 to a load of:

(a) 1,500 pounds for tires with a load rating less than 880 pounds;

(b) 2,000 pounds for tires with a load rating of 880 pounds or more but less than 1,400 pounds.

(c) 2,500 pounds for tires with a load rating of 1,400 pounds or more, using the load rating marked on the tire or tire assembly.

S4.2.2.4 *Tire Strength.* There shall be no visual evidence of tread carcass separation, cracking or chunking, when a tire is tested in accordance with S5.3 to a minimum energy level of:

Load Rating	*Minimum Energy Level*
Below 880 pounds	1,950 inch pounds
880 pounds and above	2,600 inch pounds

S4.2.2.5 *Tire Endurance.* When the tire has been subjected to the laboratory endurance test specified in S5.4, using, if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.2.2.6 *High Speed Performance.* When the tire has been subjected to the laboratory high speed performance test specified in S5.5, using if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.3 *Labeling Requirements.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides of the tire or tire assembly in letters or numerals not less than 0.078 inches high, the information shown in paragraphs S4.3(a) through (f). Except, in the case of a non-pneumatic tire assembly of which one side always must face outward when mounted on a vehicle, the information shown in paragraphs S4.3(a) through (f) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in S4.4 of this standard or in 49 CFR §571.110 or 49 CFR §571.120.

(a) The non-pneumatic tire identification code.

(b) Load rating, which, if expressed in kilograms, shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole pound;

(c) For a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly, the size and type designation of the non-pneumatic rim or wheel tire assembly that is contained in the submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation;

(d) The name of the manufacturer or brand name;

(e) The symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(f) The tire identification number required by §574.5 of this chapter;

(g) The labeling requirements set forth in S6 of Standard No. 110 (§571.110), or S8 of Standard No. 120 (§571.120).

S4.4 *Non-Pneumatic Tire Identification Code and Non-Pneumatic Rim/Wheel Center Member Matching Information.* For purposes of this standard, S8 of 49 CFR 571.110 and S10 of 49 CFR 571.120, each manufacturer of a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly shall ensure that it provides a listing to the public for each non-pneumatic tire that it produces. The listing shall include the non-pneumatic tire identification code, tire load rating, dimensional specifications and a diagram of the portion of the tire that attaches to the non-pneumatic rim or wheel center member, and a list of the non-pneumatic rims or wheel center members that may be used with that tire. For each non-pneumatic rim or wheel center member included in such a listing, the information provided shall include a size and type designation for the non-pneumatic rim or wheel center member, and dimensional specifications and a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire if the non-pneumatic rim's or portion of the wheel center member's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this section. The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires or, in the case of non-pneumatic tires supplied only as a temporary spare tire on a vehicle, in a document furnished to dealers of vehicles equipped with the tires, to any person upon request, and in duplicate to the Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, or at least one of the following organizations:

The Tire and Rim Association

The European Tire and Rim Technical Organization

Japan Automobile Tire Manufacturers' Association, Inc.

Deutsche Industrie Norm

British Standards Institute

Scandinavian Tire and Rim Organization

Tyre and Rim Association of Australia

S5 *Test Procedures.*

S5.1 *Physical Dimensions.* After conditioning the tire at room temperature for at least 24 hours, using equipment with minimum measurement capabilities of one-half the smallest tolerance specified in the listing contained in the submission made by a manufacturer pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation, measure the portion of the tire that attaches to the non-pneumatic rim or the wheel center member. For any inner diameter dimensional specifications, or other dimensional specifications that are uniform or uniformly spaced around some circumference of the tire, these measurements shall be taken at least six points around the tire, or if specified, at the points specified in the listing contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S5.2 *Lateral Strength.*

S5.2.1 *Preparation of the tire.*

S5.2.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.2.1.2 Mount the tire assembly in a fixture as shown in Figure 1 with the surface of the tire assembly that would face outward when mounted on a vehicle facing toward the lateral strength test block shown in Figure 2 and force the lateral strength test block against the tire.

S5.2.2 *Test Procedure.*

S5.2.2.1 Apply a load through the block to the tire at a rate of 2 inches per minute, with the load arm parallel to the tire assembly at the time of engagement and the first point of contact with the test block being the test block centerline shown in Figure 2, at the following distances, B, in sequence, as shown in Figure 1:

B = A − 1 inch
B = A − 2 inches
B = A − 3 inches
B = A − 4 inches
B = A − 5 inches, and
B = A − 6 inches

However, if at any time during the conduct of the test, the test block comes in contact with the non-pneumatic test rim or test wheel center member, the test shall be suspended and no further testing at smaller values of the distance B shall be conducted. When tested to the above procedure, satisfying the requirements of S4.2.2.3 for all values of B greater than that for which contact between the non-pneumatic test rim or test wheel center member and the test block is made, shall constitute compliance to the requirements set forth in S4.2.2.3.

S5.3 *Tire Strength.*

S5.3.1 *Preparation of the Tire.*

S5.3.1.1 If applicable, mount the tire on a non-pneumatic test rim or test wheel center member.

S5.3.1.2 Condition the tire assembly at room temperature for at least three hours.

S5.3.2 *Test Procedures.*

S5.3.2.1 Force the test cleat, as defined in S5.3.2.2, with its length axis (see S5.3.2.2(a)) parallel to the rolling axis of the non-pneumatic tire assembly, and its height axis (see S5.3.2.2(c)), coinciding with a radius of the non-pneumatic tire assembly, into the tread of the tire at five test points equally spaced around the circumference of the tire. At each test point, the test cleat is forced into the tire at a rate of two inches per minute until the applicable minimum energy level, as shown in S4.2.2.4, calculated using the formula contained in S5.3.2.3, is reached.

S5.3.2.2 The test cleat is made of steel and has the following dimensions:

(a) Length of one inch greater than the maximum tire width of the tire.

(b) Width of one-half inch with the surface which contacts the tire's tread having one-quarter inch radius.

(c) Height of one inch greater than the difference between the unloaded radius of the non-pneumatic tire assembly and the minimum radius of the non-pneumatic rim or wheel center member, if used with the non-pneumatic tire assembly being tested.

S5.3.2.3 The energy level is calculated by the following formula:

$$E = \frac{F \times P}{2}$$

where

E = Energy level, inch-pounds;

F = Force, pounds; and

P = Penetration, inches

S5.4 *Tire Endurance.*

S5.4.1 *Preparation of the tire.*

S5.4.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.4.1.2 Condition the tire assembly to 100 ± 5° F. for at least three hours.

S5.4.2 *Test Procedure.*

S5.4.2.1 Mount the tire assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the maximum tire width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's non-pneumatic tire identification code designation.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5° F.

S5.4.2.3 Conduct the test at 50 miles per hour (m.p.h.) in accordance with the following schedule without interruption (the loads for the following periods are the specified percentage of the load rating marked on the tire or tire assembly):

	Percent
4 hours	85
6 hours	90
24 hours	100

S5.4.2.4 Immediately after running the tire the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.5.

S5.5 *High Speed Endurance.*

S5.5.1 After preparing the tire in accordance with S5.4.1, if applicable, mount the tire assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's load rating as marked on the tire or tire assembly.

S5.5.2 Break in the tire by running it for 2 hours at 50 m.p.h.

S5.5.3 Allow to cool to 100 ± 5° F.

S5.5.4 Test at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and 85 m.p.h. for 30 minutes.

S5.5.5 Immediately after running the tire for the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.6.

S6 *Nonconforming tires.* Any non-pneumatic tire that is designed for use on passenger cars that does not conform to all the requirements of this standard, shall not be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose.

* * * * *

12. Figures 1 and 2 are added following the text of Standard No. 129, appearing as follows:

Part 574 [Amended]

13. The first sentence of 574.4 *Applicability* is revised to read as follows:

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires, and new non-pneumatic tires and non-pneumatic tire assemblies for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948.

* * * * *

14. The first sentence of 574.5 *Tire identification requirements* is revised to read as follows:

Each tire manufacturer shall conspicuously label on one sidewall of each tire it manufactures, except tires manufactured exclusively for mileage-contract purchasers, or non-pneumatic tires or non-pneumatic tire assemblies, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number

containing the information set forth in paragraphs (a) through (d) of this section.

* * * * *

15. Section 574.5 is amended by adding the following to the end of the opening paragraph:

* * * * *

Each manufacturer of a non-pneumatic tire or a non-pneumatic tire assembly shall permanently mold, stamp, or otherwise permanently mark into or onto one side of the non-pneumatic tire or non-pneumatic tire assembly a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by the Federal motor vehicle safety standards shall be positioned relative to the tire identification number as shown in Figure 1, and the symbols to be used for the other information are those listed above. The labeling for a non-pneumatic tire or a non-pneumatic tire assembly shall be in the manner specified in Figure 1 and positioned on the non-pneumatic tire or non-pneumatic tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of the non-pneumatic rim or wheel center member designated for use with that non-pneumatic tire in S4.4 of Standard No. 129 (49 CFR 571.129).

16. Section 574.5(b) is amended by adding the following after the opening sentence:

* * * * *

For a new non-pneumatic tire of a non-pneumatic tire assembly, the second group, of not more than two symbols, shall be used to identify the non-pneumatic tire identification code.

* * * * *

17. Section 574.6, *Identification Mark,* is revised to read as follows:

* * * * *

To obtain the identification mark required by 574.5(a), each manufacturer of new or retreaded pneumatic tires, non-pneumatic tires, or non-pneumatic tire assemblies shall apply in writing to "Tire Identification and Recordkeeping," National Highway Traffic Safety Administration, Department of Transportation, Washington, DC 20590, identify itself as a tire manufacturer or retreader and furnish the following information:

(a) The name, or other designation identifying the applicant, and its main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., pneumatic tires for passenger cars, buses, trucks, or motorcycles; pneumatic retreaded tires; or non-pneumatic tires or non-pneumatic tire assemblies.

Issued on July 12, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 29581
July 20, 1990

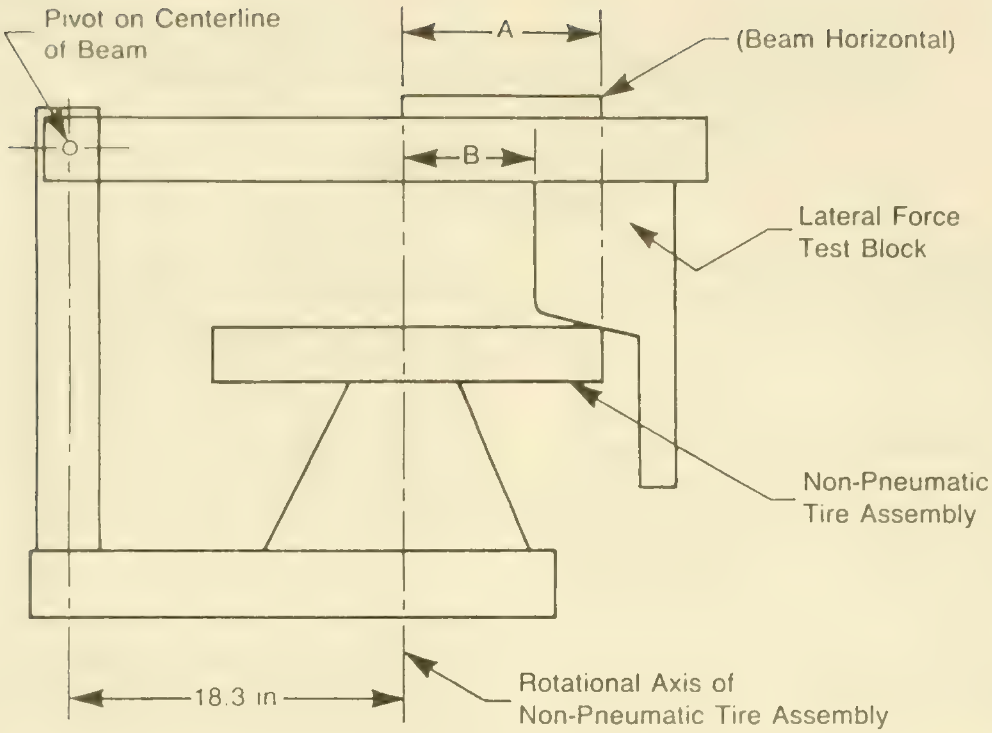

Figure 1. - Lateral Force Test Fixture (Dimension in Inches)

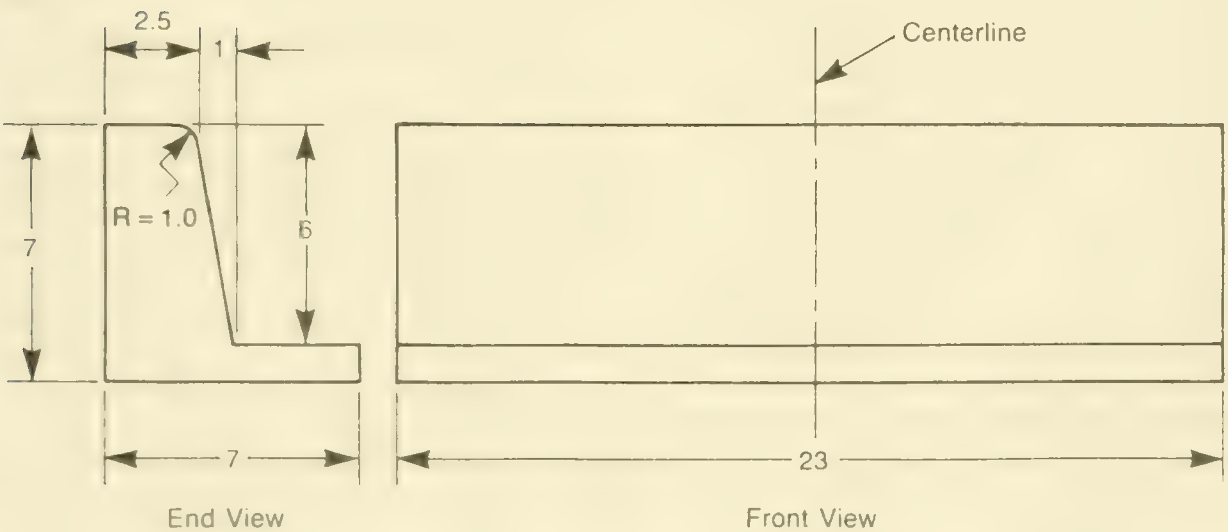

Figure 2. - Lateral Force Test Block (Dimension in Inches)
Dimensional Tolerance is ± 0.050 in

MOTOR VEHICLE SAFETY STANDARD NO. 129

New Non-Pneumatic Tires for Passenger Cars

(Docket No. 87-12; Notice 3)
RIN 2127-AC18

S1. Scope. This standard specifies tire dimensions and laboratory test requirements for lateral strength, strength, endurance, and high speed performance; defines the tire load rating; and specifies labeling requirements for non-pneumatic spare tires.

S2. Application. This standard applies to new temporary spare non-pneumatic tires for use on passenger cars.

S3. Definitions.

"Carcass" means the tire structure except for the tread which provides the major portion of the tire's capability to deflect in response to the vertical loads and tractive forces that the tire transmits from the roadway to the non-pneumatic rim, the wheel center member, or the vehicle and which attaches to the vehicle or attaches, either integrally or separably, to the wheel center member or non-pneumatic rim.

"Carcass separation" means the pulling away of the carcass from the non-pneumatic rim or wheel center member.

"Chunking" means the breaking away of pieces of the carcass or tread.

"Cracking" means any parting within the carcass, tread, or any components that connect the tire to the non-pneumatic rim or wheel center member and, if the non-pneumatic tire is integral with the non-pneumatic rim or wheel center member any parting within the non-pneumatic rim, or wheel center member.

"Load rating" means the maximum load a tire is rated to carry.

"Maximum tire width" means the greater of either the linear distance between the exterior edges of the carcass or the linear distance between the exterior edges of the tread, both being measured parallel to the rolling axis of the tire.

"Non-pneumatic rim" means a mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

"Non-pneumatic test rim" means, with reference to a tire to be tested, any non-pneumatic rim that is listed as appropriate for use with that tire in accordance with S4.4.

"Non-pneumatic tire" means a mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle, and does not rely on the containment of any gas or fluid for providing those functions.

"Non-pneumatic tire assembly" means a non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

"Non-pneumatic tire identification code" means an alphanumeric code that is assigned by the manufacturer to identify the tire with regard to its size, application to a specific non-pneumatic rim or wheel center member, or application to a specific vehicle.

"Test wheel center member" means, with reference to a tire to be tested, any wheel center member that is listed as appropriate for use with that tire in accordance with S4.4.

"Tread" means that portion of the tire that comes in contact with the road.

"Tread separation" means the pulling away of the tread from the carcass.

"Wheel" means a mechanical device which consists of a non-pneumatic rim and wheel center member and which, in the case of a non-pneumatic tire assembly incorporating a wheel, provides the connection between the tire and the vehicle.

"Wheel center member" means, in the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle.

S4. Requirements.

S4.1 Size and construction. Each tire shall be designed to fit each non-pneumatic rim or wheel center member specified for its non-pneumatic tire identification code designation in a listing in accordance with section S4.4.

S4.2 Performance requirements.

S4.2.1 General. Each tire shall conform to the following:

(a) Its load rating shall be that specified in a submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for its non-pneumatic tire identification code designation.

(b) It shall incorporate a tread wear indicator that will provide a visual indication that the tire has worn to a tread depth of $^1/_{16}$ inch.

(c) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high speed performance procedure specified in S5.5, exhibit no visual evidence of tread or carcass separation, chunking or cracking.

(d) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 tires.

S4.2.2 Test requirements.

S4.2.2.1 Test sample. For each test sample use:

(a) One tire for physical dimensions, lateral strength, and strength in sequence;

(b) A second tire for tire endurance; and

(c) A third tire for high speed performance.

S4.2.2.2 Physical Dimensions. For a non-pneumatic tire assembly in which the tire is separable from the non-pneumatic rim or wheel center member, the dimensions, measured in accordance with S5.1, for that portion of the tire that attaches to that non-pneumatic rim or wheel center member shall satisfy the dimensional specifications contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S4.2.2.3 Lateral strength. There shall be no visual evidence of tread or carcass separation, cracking or chunking, when a tire is tested in accordance with S5.2 to a load of:

(a) 1,500 pounds for tires with a load rating less than 880 pounds;

(b) 2,000 pounds for tires with a load rating of 880 pounds or more but less than 1,400 pounds.

(c) 2,500 pounds for tires with a load rating of 1,400 pounds or more, using the load rating marked on the tire or tire assembly.

S4.2.2.4 Tire strength. There shall be no visual evidence of tread carcass separation, cracking or chunking, when a tire is tested in accordance with S5.3 to a minimum energy level of:

Load Rating	*Minimum Energy Level*
Below 880 pounds	1,950 inch pounds
880 pounds and above	2,600 inch pounds

S4.2.2.5 Tire endurance. When the tire has been subjected to the laboratory endurance test specified in S5.4, using, if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.2.2.6 High speed performance. When the tire has been subjected to the laboratory high speed performance test specified in S5.5, using if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.3 Labeling requirements. Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides of the tire or tire assembly in letters or numerals not less than 0.078 inches high, the information shown in paragraphs S4.3(a) through (f). Except, in the case of a non-pneumatic tire assembly of which one side always must face outward when mounted on a vehicle, the information shown in paragraphs S4.3(a) through (f) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in S4.4 of this standard or in 49 CFR §571.110 or 49 CFR §571.120.

(a) The non-pneumatic tire identification code.

(b) Load rating, which, if expressed in kilograms, shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole pound;

(c) For a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly, the size and type designation of the non-pneumatic rim or wheel tire assembly that is contained in the submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation;

(d) The name of the manufacturer or brand name;

(e) The symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(f) The tire identification number required by §574.5 of this chapter;

(g) The labeling requirements set forth in S6 of Standard No. 110 (§571.110), or S8 of Standard No. 120 (§571.120).

S4.4 Non-pneumatic tire identification code and non-pneumatic rim/wheel center member matching information. For purposes of this standard, S8 of 49 CFR 571.110 and S10 of 49 CFR 571.120, each manufacturer of a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly shall ensure that it provides a listing to the public for each non-pneumatic tire that it produces. The listing shall include the non-pneumatic tire identification code, tire load rating, dimensional specifications and a diagram of the portion of the tire that attaches to the non-pneumatic rim or wheel center member, and a list of the non-pneumatic rims or wheel center members that may be used with that tire. For each non-pneumatic rim or wheel center member included in such a listing, the information provided shall include a size and type designation for the non-pneumatic rim or wheel center member and dimensional specifications and a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire if the non-pneumatic rim's or portion of the wheel center member's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this section. The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires or, in the case of non-pneumatic tires supplied only as a temporary spare tire on a vehicle, in a document furnished to dealers of vehicles equipped with the tires, to any person upon request, and in duplicate to the Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, of at least one of the following organizations:

The Tire and Rim Association

The European Tire and Rim Technical Organization

Japan Automobile Tire Manufacturers' Association, Inc.

Deutsche Industrie Norm

British Standards Institute

Scandinavian Tire and Rim Organization

Tyre and Rim Association of Australia

S5. Test procedures.

S5.1 Physical dimensions. After conditioning the tire at room temperature for at least 24 hours, using equipment with minimum measurement capabilities of one-half the smallest tolerance specified in the listing contained in the submission made by a manufacturer pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation, measure the portion of the tire that attaches to the non-pneumatic rim or the wheel center member. For any inner diameter dimensional specifications, or other dimensional specifications that are uniform or uniformly spaced around some circumference of the tire, these measurements shall be taken at least six points around the tire, or if specified, at the points specified in the listing contained in the submission made by an individual manufacturer; pursuant to S4.4(a), or in one of the publications described in S4.4(b) for the tire's non-pneumatic tire identification code designation.

S5.2 Lateral strength.

S5.2.1 Preparation of the tire.

S5.2.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.2.1.2 Mount the tire assembly in a fixture as shown in Figure 1 with the surface of the tire assembly that would face outward when mounted on a vehicle facing toward the lateral strength test block shown in Figure 2 and force the lateral strength test block against the tire.

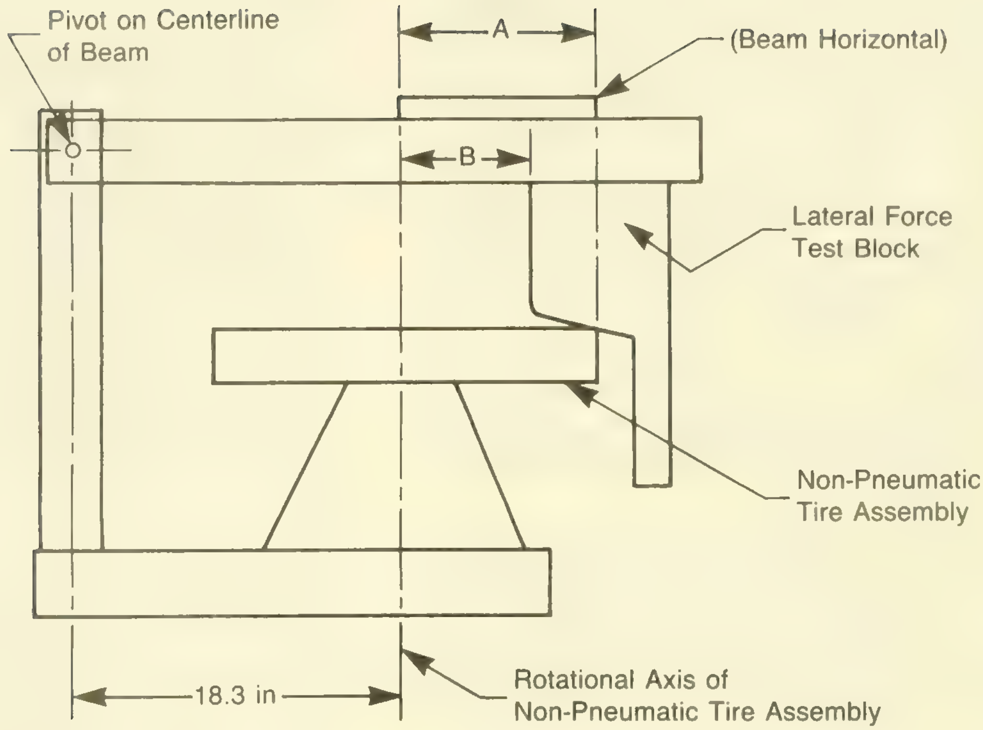

Figure 1. - Lateral Force Test Fixture (Dimension in Inches)

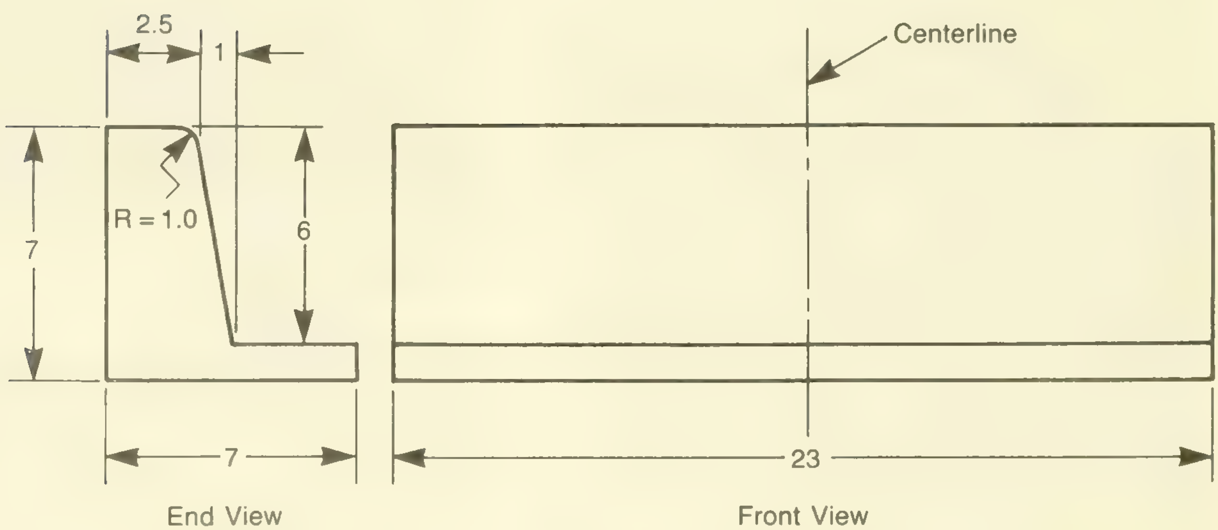

Figure 2. - Lateral Force Test Block (Dimension in Inches)
Dimensional Tolerance is ±0.050 in

S5.2.2 Test procedure.

S5.2.2.1 Apply a load through the block to the tire at a rate of 2 inches per minute, with the load arm parallel to the tire assembly at the time of engagement and the first point of contact with the test block being the test block centerline shown in Figure 2, at the following distances, B, in sequence, as shown in Figure 1:

B = A − 1 inch
B = A − 2 inches
B = A − 3 inches
B = A − 4 inches
B = A − 5 inches
B = A − 6 inches

However, if at any time during the conduct of the test, the test block comes in contact with the non-pneumatic test rim or test wheel center member, the test shall be suspended and no further testing at smaller values of the distance B shall be conducted. When tested to the above procedure, satisfying the requirements of S4.2.2.3 for all values of B greater than that for which contact between the non-pneumatic test rim or test wheel center member and the test block is made, shall constitute compliance to the requirements set forth in S4.2.2.3.

S5.3 Tire strength.

S5.3.1 Preparation of the tire.

S5.3.1.1 If applicable, mount the tire on a non-pneumatic test rim or test wheel center member.

S5.3.1.2 Condition the tire assembly by room temperature for at least three hours.

S5.3.2 Test procedures.

S5.3.2.1 Force the test cleat, as defined in S5.3.2.2, with its length axis (see S5.3.2.2(a)) parallel to the rolling axis of the non-pneumatic tire assembly, and its height axis (see S5.3.2.2(c)), coinciding with a radius of the non-pneumatic tire assembly, into the tread of the tire at five test points equally spaced around the circumference of the tire. At each test point, the test cleat is forced into the tire at a rate of two inches per minute until the applicable minimum energy level, as shown in S4.2.2.4, calculated using the formula contained in S5.3.2.3, is reached.

S5.3.2.2 The test cleat is made of steel and has the following dimensions:

(a) Length of one inch greater than the maximum tire width of the tire.

(b) Width of one-half inch with the surface which contacts the tire's tread having one-quarter inch radius.

(c) Height of one inch greater than the difference between the unloaded radius of the non-pneumatic tire assembly and the minimum radius of the non-pneumatic rim or wheel center member, if used with the non-pneumatic tire assembly being tested.

S5.3.2.3 The energy level is calculated by the following formula:

$$E = \frac{F \times P}{2}$$

E = Energy level, inch-pounds;
F = Force, pounds; and
P = Penetration, inches

S5.4 Tire Endurance.

S5.4.1 Preparation of the tire.

S5.4.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.4.1.2 Condition the tire assembly to 100 ±5° F. for at least three hours.

S5.4.2 Test procedure.

S5.4.2.1 Mount the tire assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the maximum tire width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's non-pneumatic tire identification code designation.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ±5° F.

S5.4.2.3 Conduct the test at 50 miles per hour (m.p.h.) in accordance with the following schedule without interruption (the loads for the following periods are the specified percentage of the load rating marked on the tire or tire assembly):

	Percent
4 hours	85
6 hours	90
24 hours	100

S5.4.2.4 Immediately after running the tire the required time, allow the tire to cool of one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.5.

S5.5 High speed endurance.

S5.5.1 After preparing the tire in accordance with S5.4.1, if applicable, mount the tire assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's load rating as marked on the tire or tire assembly.

S5.5.2 Break in the tire by running it for 2 hours at 50 m.p.h.

S5.5.3 Allow to cool to 100 $\pm 5°$ F.

S5.5.4 Test at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and 85 m.p.h. for 30 minutes.

S5.5.5 Immediately after running the tire for the required time, allow the tire to cool for one hour, then if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.6.

S6 Nonconforming tires. Any non-pneumatic tire that is designed for use on passenger cars that does not conform to all the requirements of this standard, shall not be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose.

55 F.R. 29581
July 20, 1990

U.S. Government Printing Office: 1991 — 521 549/40001

TD 8.
Federal

US Department of Transportation
National Highway Traffic Safety Administration

Federal Motor Vehicle Safety Standards and Regulations

Supplement 43—Amendments and Interpretations Issued During 1990

Page Control Chart

(1) Part 533—Light Truck Average Fuel Economy Standards

(a) Insert attached pages numbered PART 533; PRE 137 through PART 533; PRE 151-152 behind page in book numbered PART 533; PRE 135-136.

(b) Note: The amendment included in the preamble mentioned above was made prior to the issuance of the preamble. The attached preamble is issued for reference continuity.

(2) Federal Motor Vehicle Safety Standard No. 108

Pen and ink change. Change page in book following page numbered PART 571; S108—PRE 331 from PART 571; S208—PRE 332 to PART 571; S108—PRE 332.

(a) Insert attached pages numbered PART 571; S108—PRE 357-358 behind page in book numbered PART 571; S108—PRE 332.

(b) Substitute attached Standard 108 (except for art pages) for Standard 108 in book.

(c) Substitute attached Art Page 25-26 for similar page in book.

(d) Insert attached Art Pages 83 through 94 behind Art Page 82 in book.

(3) Federal Motor Vehicle Safety Standard No. 109

(a) Insert attached pages numbered PART 571; S109—PRE 65 through PART 571; S109—PRE 74 behind page in book numbered PART 571; S109—PRE 64.

(b) Substitute attached pages numbered PART 571; S109—1 through PART 571; S109—9; and page PART 571; S109A-1 for similarly numbered pages in book.

(4) Federal Motor Vehicle Safety Standard No. 110

Correction: In supplement No. 42, the Preamble pages were cited as pages PART; S110—PRE 9 through PART 571; S110—PRE 28. The latter should have been PART 571; S110—PRE 25-26.

(5) Federal Motor Vehicle Safety Standard No. 116

(a) Insert attached page numbered PART 571; S116—PRE 41 behind page in book numbered PART 571; S116—PRE 39-40.

(b) Substitute attached pages numbered PART 571; S116—1 through PART 571; S116—4 for similarly numbered pages in book.

(6) Federal Motor Vehicle Safety Standard No. 121

(a) Insert attached pages numbered PART 571; S121—PRE 193 through PART 571; S121—PRE 195-196 behind page in book numbered PART 571; S121-PRE 191-192.

(b) Substitute attached page numbered PART 571; S121—7 for similarly numbered page in book.

(7) Federal Motor Vehicle Safety Standard No. 208

(a) Insert attached pages numbered PART 571; S208—PRE 459 through PART 571; S208—PRE 477-478 behind page in book numbered PART 571; S208—PRE 457-458.

(b) Substitute attached Standard 208 for Standard 208 in book.

The Federal Motor Vehicle Safety Standards and amendments published in this format are for reference purposes only. They should not be considered as legally binding or be used as a source of authority in matters of litigation. *The United States Code of Federal Regulations* is the only source of legal authority for the standards.

PREAMBLE TO AN AMENDMENT TO PART 533
Light Truck Average Fuel Economy Standards
(Docket No. FE-88-03; Notice 3)
RIN 2127-AC 51

ACTION: Final rule.

SUMMARY: This notice establishes the average fuel economy standard for light trucks manufactured in model year (MY) 1992. Issuance of the standard is required by Title V of the Motor Vehicle Information and Cost Savings Act. For MY 1992, the combined standard for all light trucks manufactured by a manufacturer is 20.2 mpg. The agency is not setting optional separate two-wheel drive and four-wheel drive standards.

DATES: The amendment is effective May 4, 1990. The standard applies to the 1992 model year.

I. Background

Issuance of light truck fuel economy standards is required by section 502(b) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2002(b)). That section requires the Secretary of Transportation to set light truck fuel economy standards at the maximum feasible average fuel economy level for each model year after 1978. In determining maximum feasible average fuel economy levels, the Secretary is required under section 502(e) of the Act to consider four factors: technological feasibility, economic practicability, the effect of other Federal motor vehicle standards on fuel economy, and the need of the nation to conserve energy. See 15 U.S.C. 2002(e). Responsibility for the automotive fuel economy program was delegated by the Secretary of Transportation to the Administrator of NHTSA (41 FR 25015, June 22, 1976)). Pursuant to this authority, the light truck standards set most recently by the agency have been 20.0 mpg for MY 1990 and 20.2 mpg for MY 1991.

On January 6, 1989, NHTSA published in the *Federal Register* a Request for Comments seeking data on manufacturers' light truck fuel economy capabilities for model years (MY) 1992–94 (54 FR 436). All of the domestic light truck manufacturers responded, as did several foreign manufacturers.

After analyzing the responses to the Request for Comments and reviewing other available data, NHTSA published a notice of proposed rulemaking (NPRM) proposing ranges of standards for light truck average fuel economy standards for MY 1992–94. 55 FR 3608 (February 2, 1990). For MY 1992, the proposed range was between 20.2 mpg and 21.0 mpg. For MY 1993, the proposed range was between 20.2 mpg and 21.5 mpg. The proposed range for MY 1994 was between 20.2 mpg and 22.0 mpg. These ranges were based on the agency's tentative evaluation of manufacturer capabilities. In past light truck CAFE rulemakings, the agency has provided manufacturers with the option of dividing their light trucks into two fleets, a two-wheel drive (2WD) fleet and a four-wheel drive (4WD) fleet and meeting a separate standard for each fleet. However, the NPRM noted NHTSA's intention to discontinue setting these separate alternative standards, in favor of a single standard, beginning with MY 1992. As discussed below, the final rule adopts this approach, and sets a single combined standard for MY 1992.

NHTSA has postponed final rulemaking for model years 1993 and 1994. The limited time available to promulgate a final rule for MY 1992 has precluded a thorough consideration of issues related to light truck CAFE standards for those latter model years. The later issuance of the final MY 1993–94 standards may also have the advantage of giving NHTSA the benefit of more definitive information about amendments to the Clean Air Act and their potential impact on fuel economy for those model years.

The agency received comments from General Motors, Ford, Chrysler, Nissan, the U.S. Department of Energy, the Natural Resources Defense Council, the Western Interstate Energy Board, the Energy Conservation Coalition and the National Automobile Dealers Association. The issues raised by the commenters are discussed below.

II. Summary of Decision for Model Year 1992.

Based on its analysis, the agency is establishing a combined average fuel economy standard for MY 1992 at 20.2 mpg. Alternative separate standards for 2WD and 4WD light trucks are not being established. A decision will be reached later this year with respect to the light truck standards for MY 1993–94.

III. Manufacturer Capabilities for MY 1992.

As part of its consideration of technological feasibility and economic practicability, the agency has evaluated manufacturers' fuel economy capabilities for MY 1992–94. In making this evaluation, the agency has analyzed manufacturers' current projections and underlying product plans and has considered what, if any, additional actions the manufacturers could take to improve their fuel economy. A more detailed discussion of these issues is contained in the agency's Final Regulatory Impact Analysis (FRIA), which has been placed in the docket for this rulemaking. Some of the information included in the FRIA, including the details of manufacturers' future product plans, has been determined by the agency to be confidential business information, release of which could cause competitive harm. The public version of the FRIA omits the confidential information.

A. Manufacturer Projections

General Motors: As discussed in the NPRM, General Motors (GM) projected in March 1989 that it could achieve a combined CAFE level of 20.6 mpg in MY 1992. In its March 1990 comments on the NPRM, GM has revised its projection slightly upward, to 20.7 mpg. GM attributes this slight increase in its MY 1992 projection to adjustments to projected powertrain and model mixes, and to minor adjustments of estimated MY 1992 fuel economy for certain models.

By comparison, in a pre-model year report submitted in December 1989, GM projected a MY 1990 CAFE of 19.6 mpg. The improvement projected by GM between MY 1990 and MY 1992 is attributable to several factors, including the introduction of the GEO Tracker to the domestic 4WD fleet, increased penetration of certain engine technologies and aerodynamic improvements, a slight weight decrease and a shift toward more efficient models, for a net improvement by MY 1992 over MY 1990 of 1.1 mpg.

However, in making its projection for MY 1992, GM noted that the actual level it achieved could be lower due to various uncertainties such as fuel prices, consumer demand for increased power and performance, new safety requirements and increasing competition in the light truck market. GM also stated that certain program risks (subject to a claim of confidentiality) could cause a decline in GM's projected MY 1992 CAFE to 20.5 mpg. GM recommended that the MY 1992 standard be set at or near the low end of the proposed range.

Ford

Ford projected in March 1989 that it could achieve CAFE levels of 19.9 mpg to 20.2 mpg in MY 1992. By comparison, in a pre-model year report submitted in December 1989, Ford projected a MY 1990 combined light truck CAFE of 20.1 mpg. In its March 1990 comments on the NPRM, Ford has revised its MY 1992 projection upward, to a range of between 20.1–20.5 mpg. Ford attributes the increase to several minor adjustments to its computer-generated projection, and to a number of small technology improvements. In addition, Ford's projection now takes into account the fuel economy benefits expected from the use of Fuel Economy Data Vehicles (FEDV's) in fuel economy testing. These changes raise Ford's MY 1992 projection to 20.5 mpg. However, the company believes this figure should be adjusted to account for risks and opportunities, and that when adjusted, the revised figure, corresponding to the low end of Ford's projection, is 20.1 mpg. These considerations include such factors as whether FEDV fleet testing will produce a benefit as high as that projected by Ford in its 20.5 mpg projection and by NHTSA in the NPRM (a 0.3 mpg gain), certain technological improvements achieving results higher or lower than anticipated, and potential mix shifts. Ford provides a 0.3 mpg increase based on potential FEDV testing benefits, but then factors in a 0.2 mpg risk for potential FEDV results below that level. In support of its analysis, Ford indicates that it only achieved a 0.04 mpg benefit from FEDV testing for MY 1989.

In its response to the NPRM, Ford also emphasized the potential effect on CAFE of factors beyond its control, including unforeseen but normal technological shortfalls from the technological changes listed in its comments, the potential for increased import market share and concomitant loss of domestic share in the compact truck market segment, and the pending safety requirements for light trucks. In addition, Ford indicated that continued low fuel prices could further increase the market demand for full-size light trucks, larger engines and increased optional equipment, causing a decline in its CAFE. Ford recommended that the MY 1992 standard be set at 20.2 mpg.

Chrysler

Chrysler projected in March 1989 that it could achieve a CAFE level of 21.0 mpg in MY 1992. By comparison, Chrysler's December, 1989 pre-model year report for MY 1990 indicated a MY 1990 CAFE of 21.6 mpg. The 0.6 mpg decline from MY 1990 to MY 1992 is a result of product changes and revised fuel economy estimates for certain models. In its March 1990 response to the NPRM, Chrysler projected its MY 1992 CAFE at 21.2 mpg. This additional projected increase is the result of several technical improvements now planned for MY 1992 along with revised fuel economy projections, which would raise Chrysler's fuel economy level 0.5 mpg. However, these changes are offset in part by revised

mix projections and product changes, for a net improvement of 0.2 mpg.

Several assumptions underlie Chrysler's fuel economy projection. These include assuming that the projected model mix accurately reflects market demands, that the variability of actual fuel economy test values is no greater than anticipated, and that running changes to its products do not have an adverse cumulative effect. Chrysler also pointed to the U.S. economy as a factor which could negatively impact its CAFE if economic conditions worsen to the point that they necessitate the delay or postponement of certain plans. The company also expressed concern about the potential CAFE impact of the increased safety requirements due to be imposed on light trucks by MY 1992. Because of these factors, Chrysler recommended a standard of 20.2 mpg for MY 1992, even though its current MY 1992 projection is 21.2 mpg.

Other Manufacturers

Volkswagen (VW) currently offers only one light truck model, the Vanagon compact bus. Volkswagen's combined light truck CAFE for MY 1990 is estimated at 21.0 mpg. VW indicated in its response to the January 1989 questionnaire that it has no significant plans to increase fuel economy by MY 1992. The company's product plans are indefinite, but may involve a larger engine, or a front wheel drive model.

Range Rover projected its light truck CAFE for MY 1989 at 15.3 mpg in April 1989. At that time, the company did not expect any significant fuel economy improvement by MY 1992. However, the company has projected its 1990 CAFE at 16.3 mpg, 1.0 mpg higher than their MY 1989 projection.

Other foreign light truck manufacturers only compete in the small vehicle portion of the light truck market and are therefore expected to achieve CAFE levels well above GM and Ford.

B. Possible Additional Actions to Improve MY 1992 CAFE

There are additional actions which the agency analyzed to improve manufacturers' CAFE's above the levels which they currently project for MY 1992. These actions may be divided into three categories: further technological changes to their product plans, increased marketing efforts, and product restrictions.

1. *Further Technological Changes*

The ability to improve CAFE by further technological changes to product plans is dependent on the availability of fuel efficiency enhancing technologies which manufacturers are able to apply within the available leadtime.

The agency's FRIA discusses the fuel efficiency enhancing technologies which are expected to be available by MY 1992. Limited leadtime is a constraint for MY 1992 on the increased use of these technologies. NHTSA recognizes that the leadtime necessary to implement significant improvements in engines, transmissions, aerodynamics and rolling resistance is typically about three years. Also, as the agency discussed in establishing the final rule for MY 1990–91, once a new design is established and tested as feasible for production, the leadtime necessary to design, tool, and test components such as new body sheet-metal subsystems for mass production is typically 22 to 29 months. Other potential major changes may take longer. Leadtimes for new vehicles are usually at least three years.

Given leadtime constraints, the agency does not believe that manufacturers can achieve significant improvements in their projected MY 1992 CAFE levels by additional technological actions. Some improvements are, of course, possible due to slight increases in the penetration of more fuel efficient technology or changes in model mix. However, such changes are likely to be market driven, and are not likely to provide an increase of more than 0.1 mpg for any manufacturer.

2. *Increased Marketing Efforts*

As discussed in the NPRM, NHTSA believes that the ability to improve light truck CAFE by marketing efforts is relatively small. Light trucks are often purchased for their work-performing capabilities. This is particularly true for the larger, less fuel-efficient light trucks. Since the smaller light trucks cannot meet the needs of all light truck users, the manufacturers' ability to use marketing efforts to encourage consumers to purchase smaller light trucks instead of larger light trucks is limited.

As a practical matter, marketing efforts to improve CAFE are largely limited to techniques which either make fuel-efficient vehicles less expensive or less fuel-efficient vehicles more expensive. Moreover, the ability of a manufacturer to increase sales of fuel-efficient light trucks depends in part on increasing its market share at the expense of competitors or pulling ahead its own sales from the future. The ability of domestic manufacturers to make such sales increases is also affected by the strong competition in that market from Japanese manufacturers. While the Japanese manufacturers currently have an overall combined market share of about 30 percent of light trucks, their share for the smaller, more fuel-efficient light trucks is about 45 percent.

A problem with pulling ahead sales is that the manufacturers' CAFE levels for subsequent years are reduced. For example, if a manufacturer improves its MY 1992 CAFE by pulling ahead sales of fuel-efficient light trucks from MY 1993, its MY

1993 CAFE will decrease, compared with the level it would have been in the absence of any pull-ahead sales attributable to marketing efforts. For this reason, a manufacturer cannot continually improve its CAFE simply by pulling ahead sales.

Given these considerations, NHTSA concludes that the domestic manufacturers cannot significantly improve their MY 1992 CAFE levels through increased marketing efforts.

3. *Product Restrictions*

As an alternative to technological improvements, manufacturers could improve their CAFE by restricting their product offerings (e.g., limiting or deleting production of particular larger light truck models and larger displacement engines). Such product restrictions could have adverse economic impacts on the industry and the economy as a whole. The FRIA presents a scenario as an example in which GM and Ford are assumed to restrict production of sufficient numbers of their least fuel-efficient light truck models to obtain a 0.5 mpg improvement in CAFE beyond their projected capabilities for MY 1992. Under this scenario, GM could suffer a sales loss of up to 171,000 light trucks for MY 1992, while Ford could experience a sales loss of more than 168,000 light trucks in MY 1992. The potential job losses under this scenario in manufacturing and supplier industries could total 23,000 to 68,000 for MY 1992. These numbers are probably overstated, since, as GM has stated in past light truck rulemakings, and Ford has stated in its comments on this rule, product restrictions of the type envisioned above would likely be considered only after attempting marketing efforts and restricting the availability of particular engines and axle ratios. Ford and GM both submitted analyses of the sales and employment impact of setting the standard at 0.5 mpg beyond their respective capabilities. Both manufacturers' analyses show impacts much less than those projected above. However, the scenario is illustrative of the types of impacts that could result from standards that exceed manufacturers' true capabilities. In addition to the adverse impacts on the automotive industry, a wide range of businesses could be seriously affected to the extent that they could not obtain the light trucks they need for business use.

The U.S. Department of Energy (DOE) commented that NHTSA's method of analysis yields estimates of economic impacts that are so much larger than those that would actually occur, that it may not be meaningful to consider them. Although not advocating the payment of fines as an alternative to compliance, DOE suggests that the fines paid in such a circumstance would be a better context in which to evaluate the maximum negative impacts of a standard 0.5 mpg above the manufacturers' capability.

DOE's illustration is as follows: A fine of $25 per truck (which would be the fine for falling 0.5 mpg below the standard) for approximately 4 million trucks would amount to $100 million, or $230 per truck for each truck that NHTSA assumes will not be sold in the scenario presented in the FRIA. If the fines were passed on to consumers in the form of price increases, DOE estimates the net loss of truck sales would be less than 10,000 vehicles. Using NHTSA's figures on the number of jobs per vehicle, DOE calculates that the maximum net loss of jobs would be less than 2,000.

NHTSA does not dispute DOE's analysis for the case where manufacturers choose to pay penalties rather than comply with a standard beyond their capability. However, NHTSA's analysis focuses on the maximum impacts that would occur if manufacturers chose to comply with the standard through product restrictions, or were forced to so comply because marketing or other measures were unsuccessful.

The agency believes it would be a meaningless exercise to estimate employment losses based on the assumption that manufacturers pay fines rather than restrict production to meet standards. No fuel savings would result from setting higher standards if manufacturers paid fines instead of actually raising their CAFE values. Under this scenario, higher fuel economy standards would merely result in higher truck prices, lower sales, and increasing unemployment, without any energy conservation benefits. This scenario is not appropriate for the agency to consider. Moreover, the agency believes the statute directs us to consider the maximum fuel economy level that manufacturers can *achieve,* rather than the impact of penalties paid if the standards are not achieved.

Ford's comments expressed concern that establishing a CAFE standard beyond its capability could result in a substantial loss of sales, adverse employment effect, and economic hardship. The company is also concerned that product restrictions could have a substantial impact on Ford's competitiveness by restricting the availability of certain engines in larger models, and possibly by requiring the deletion of some full-size products entirely. The company also stated that market research data show that the vehicles most likely to be restricted are used for a combination of commercial as well as personal uses.

In its comments, GM expressed concern about the impact of product restrictions on consumer choice and industry employment. GM also provided data showing the impact product restrictions would have on the availability of various models in its light truck fleet.

Given these considerations, NHTSA concludes

that significant product restrictions should not be considered as part of manufacturers' capabilities to improve MY 1992 CAFE levels.

C. **Manufacturer-Specific CAFE Capabilities**

As discussed later in this notice, NHTSA is directed to take "industrywide considerations" into account in setting fuel economy standards. In carrying out this direction, the agency focuses on the least capable manufacturer with substantial shares of light truck sales. For MY 1992, the agency has determined that Ford is the least capable manufacturer with a substantial share of sales. During MY 1989, Ford had a 26 percent share of combined light truck sales. By comparison, GM had a 33 percent share, and Chrysler a 21 percent share. VW does not have a substantial share of industry sales. Its MY 1989 market share was 0.08 percent.

GM, Ford and Chrysler's MY 1992 CAFE projections are subject to a number of uncertainties which are discussed above. NHTSA has fully considered these uncertainties in determining manufacturer-specific capabilities.

Ford: As discussed above, in March 1989, Ford projected a MY 1992 CAFE of 19.9 mpg to 20.2 mpg. In its March 1990 comments, Ford projects a CAFE of 20.1 mpg to 20.5 mpg. This range is the result of risks and opportunities which Ford believes could lead to a decrease of 0.4 mpg. Many of the technical risks and opportunities are each quite small. The agency believes they are likely to result in a small net gain of under 0.1 mpg. A more substantial uncertainty is the potential benefit, discussed above, for Ford to have additional vehicles tested as part of the fuel economy data vehicle (FEDV) program. In the NPRM, NHTSA stated that Ford could obtain a 0.3 mpg benefit from this test procedure, and adjusted its projection of Ford's capability accordingly. In Ford's comments on the NPRM, the company takes issue with NHTSA's analysis, pointing to its MY 1989 FEDV benefit of only 0.04 mpg. Ford also argued that correlation testing can have negative results.

Ford's CAFE projection for MY 1992 also shows a risk of nearly 0.3 mpg due to a potential mix shift toward less-efficient models. The agency believes this risk, although certainly possible, may be overstated.

On the other hand, the agency does not consider it likely that Ford can achieve the 20.5 mpg upper end of its projection for MY 1992. NHTSA acknowledges that Ford's MY 1992 CAFE could well be subject to at least some risk from both unfavorable mix shifts and FEDV testing shortfalls. The agency concludes that the maximum feasible CAFE for Ford in MY 1992 is 20.2 mpg. The agency also concludes that there is insufficient leadtime for Ford to introduce new programs or technologies beyond those already planned to increase its MY 1992 CAFE.

General Motors: In March, 1989, GM projected a MY 1992 CAFE of 20.6 mpg. In its March 1990 comments on the NPRM, GM revised its projection upward to 20.7 due to minor technical and mix adjustments. However, GM also indicated several uncertainties that could lower its projection by as much as 0.2 mpg. These risks were tied to mix shifts toward less efficient vehicles.

As with Ford's projection, NHTSA believes that GM's risk estimate is likely overstated. The agency concludes that GM is capable of achieving 20.8 mpg in 1992. Its CAFE can be increased by 0.1 mpg above its projection to 20.8 mpg if GM would drop the low-volume offering of the inefficient 7.4 litre C10 pickup.

DOE commented that the upper end of the CAFE ranges proposed in the NPRM (21.0 mpg for MY 1992) were achievable and represented the maximum feasible level. DOE's analysis was based on a linear interpolation between a base CAFE for each domestic manufacturer for MY 1987 and DOE's analysis of the manufacturers' capabilities for MY 1995. This methodology assumes both that DOE's MY 1995 projection is actually achievable and that each manufacturer has the capability to improve each year by the same fixed amount (about 0.4 mpg per model year). NHTSA questions both assumptions. Based on the manufacturers' submissions, GM will improve about 1.1 mpg between MY 1990 and MY 1992, but a large part of this is due to an unfavorable model mix in MY 1990 due to a short model year for compact pickups and utility vehicles. Ford will improve by 0.4 mpg and Chrysler will *decline* by 0.4 mpg between MY's 1990 and 1992.

The agency does not believe that DOE's extrapolation of CAFE values is a meaningful method to determine individual manufacturer capabilities for specific years, nor is it as accurate as an examination of product plans in establishing short term capabilities for individual manufacturers. NHTSA has provided DOE with comments on the draft report on which the MY 1995 projection is based, and does not believe that all issues have been resolved between DOE and NHTSA. NHTSA's concerns include the use of an old baseline which is now significantly out of date. The changes to the baseline that have occurred are due to both the introduction of new technology and market driven demand for a different model mix and higher performance. These changes make it difficult, if not impossible, for manufacturers to return to DOE's linear path of improvements, particularly given the leadtime remaining before the start of the 1992 model year. The agency is not convinced that the level of fuel econ-

omy improvements cited by DOE is either technologically achievable or economically practicable.

IV. Other Federal Standards

In determining the maximum feasible fuel economy level, the agency must take into consideration the potential effects of other Federal standards. The following section discusses other government regulations, both in process and recently completed, that may have an impact on fuel economy capability for MY 1992. For this final rule, the agency has not included any discussion of the impacts of regulations that take effect in MY 1993 or 1994. Comments received on those issues will be addressed during final rulemaking for MY 1993–94.

1. Safety Standards

As discussed by the FRIA, NHTSA has evaluated several safety rulemakings for their potential impacts on light truck fuel economy in MY 1992. These include revisions to FMVSS Nos. 208; *Occupant crash protection,* 204; *Steering control rearward displacement,* 202; *Head restraints,* 108; *Lamps, reflective devices and associated equipment,* 214; *Side door strength,* and 216; *Roof crush resistance-passenger cars.* In addition, the agency has evaluated proposed revisions to 49 Part 523, addressing vehicle classification for safety standards.

FMVSS No. 208. The agency published a final rule on November 23, 1987 (52 FR 44898) which requires that manual lap/shoulder belts installed at the front outboard seating positions of light trucks comply with the dynamic testing requirements of Standard No. 208. The rule applies to multipurpose passenger vehicles and trucks with a gross vehicle weight rating of 8500 pounds or less and an unloaded vehicle weight of 5500 pounds or less, and is effective September 1, 1991. In the MY 1990–91 light truck fuel economy rulemaking (53 FR 11074, April 5, 1988), the agency concluded that this rule was unlikely to have a significant negative impact on fuel economy capabilities. Some existing light truck designs currently meet the requirements, and others may be able to meet the requirements with relatively minor changes.

In its response to NHTSA's request for comments on manufacturers' MY 1992–94 light truck fuel economy capabilities, Ford indicated that compliance with the dynamic testing requirement could increase the weight of some of its trucks by 35 to 150 pounds, and require other changes to support customer and competitive performance requirements.

In its comments on the MY 1992–94 fuel economy NPRM, Ford reiterated its penalty estimates, and also argued that NHTSA has not properly characterized the CAFE effect of safety standards such as Standard No. 208. Ford argues that since some of the effects of standards are included in the manufacturers' fuel economy estimates, the manufacturers are not being credited with application of fuel economy improvements that are offset by the weight of additional safety requirements.

Chrysler, while noting that the added weight to meet increased safety requirements for MY 1992 had resulted in a reduction of its fuel economy projection for MY 1992, did not specify an estimated fuel economy impact specifically for the dynamic testing requirement.

In its comments on the fuel economy NPRM, GM stated that the combined effects of the dynamic testing requirement and Standard No. 204 would result in weight increases from 28–57 pounds. However, GM noted that these effects are included in its MY 1992 projection.

Since the agency has accepted the manufacturers' weight projections for this rule, NHTSA believes no specific adjustment to their projections is needed to consider the impact of the dynamic testing requirement. The agency agrees with Ford's position that maintaining a constant fuel economy standard, at a time when safety and emissions standards are becoming stricter, effectively increases the stringency of the fuel economy standard. However, the agency carefully considers the impacts of safety and emissions requirements when setting CAFE standards.

In November 1988, NHTSA proposed to require all manufacturers to install lap/shoulder belts in all forward-facing rear outboard seating position in passenger cars, light trucks, multipurpose vehicles, and small buses. 53 FR 47982 (November 29, 1988). The proposed effective dates were September 1, 1989 for passenger cars other than convertibles, and September 1, 1991 for convertibles, light trucks, multipurpose passenger vehicles, and small buses.

NHTSA published a final rule (54 FR 25275, June 14, 1989) requiring all passenger cars manufactured after December 11, 1989 to be equipped with the rear outboard lap/shoulder belts. Most recently (54 FR 46257, November 2, 1989), the agency published a final rule extending these requirements to light trucks and multipurpose vehicles effective September 1, 1991. The November 1988 NPRM noted that manufacturers planned to voluntarily install the rear-seat lap/shoulder belts in virtually all vehicles by the effective date proposed in the rule for light trucks. The projected weight increases were 1.1–5.5 pounds per vehicle, depending on vehicle type.

In its March 1990 comments on the fuel economy NPRM, Ford claimed this requirement would result in weight increases from 17–30 pounds per vehicle, including secondary weight. These increases were included in Ford's MY 1992 CAFE projections.

Ford's weight increases are substantially higher than those included in the MY 1992–94 CAFE

NPRM because the agency erroneously used incorrect weight figures in that notice. NHTSA's revised estimate, using figures from the final rule on rear lap/shoulder belts, is a range of 8–40 pounds per vehicle.

Neither GM nor Chrysler provided specific estimates of the fuel economy impact of this standard.

Because NHTSA has not altered the weight projections provided by manufacturers, no adjustment in fuel economy projections is necessary to account for the impact of this standard.

FMVSS No. 204. NHTSA has also published a final rule extending the applicability of FMVSS No. 204; *Steering control rearward displacement* to cover additional light trucks. This rule, published November 23, 1987 (52 FR 44893), and effective September 1, 1991, extends the standard to light trucks with an unloaded vehicle weight of 4000 to 5500 pounds. While NHTSA indicated its belief that the proposal would not significantly affect weight (and hence CAFE), GM and Ford argued in their comments on the proposed rule that there could be significant weight impacts. However, the agency concluded in the final rule that the steering system modifications necessary to comply with the standard would entail only minor modifications that would not have significant additional weight or fuel economy impacts.

In comments responding to the fuel economy NPRM, Ford agreed with NHTSA that weight impacts from this standard were minimal. As discussed above, GM indicated that it had combined the impacts of this rule with those of the dynamic testing requirement. Chrysler only indicated that its projection included the impact of this standard. Since NHTSA has not altered the weight projections provided by the manufacturers, no adjustments to fuel economy projections to consider the impact of this standard are necessary.

FMVSS No. 202. On September 25, 1989, NHTSA published a final rule (54 FR 39183) to amend Standard No. 202 to extend the Standard's head restraint requirement to light trucks and multipurpose passenger vehicles effective September 1, 1991. This rule would have a very minor effect on MY 1992 light truck fuel economy. In the proposed rule, NHTSA estimated that it would add an average of seven pounds to each affected vehicle. The agency has calculated that this increase would reduce measured fuel economy by approximately 0.03 mpg. However, the agency estimates that 30 percent of light trucks are already equipped with head restraints, and that the effect on the fleet would be reduced to about 0.02 mpg.

Ford and Chrysler indicated in comments on the NPRM that they planned to equip all of their light trucks with head restraints by September 1, 1991. Thus, their CAFE projections for MY 1992 already include any negative weight effects. GM indicated in its comments on the head restraint NPRM that it planned to have head restraints on 80 percent of its light truck fleet by MY 1992, with restraints being phased in for the remainder of the fleet during MY 1993–94. Under the final rule on head restraints, GM will need to add head restraints to 20 percent of its MY 1992 light trucks. NHTSA has calculated that these changes could reduce GM's CAFE projection by 0.005 mpg.

In its comments on the fuel economy NPRM, GM stated that the weight impact of head restraints has already been considered for all trucks except the S/T and C/K models in MY 1992. The company indicated that these models would suffer a 4 lb. weight penalty. Ford estimated that the penalty would typically be 10 lbs. per vehicle. Chrysler provided no specific weight estimate. Each of these manufacturers indicated that they had considered the effect of Standard No. 202 in their MY 1992 projections. Since NHTSA has not altered the weight projections provided by the manufacturers, no adjustment to their fuel economy projections is needed.

FMVSS 108. Changes to the agency's lighting standard permit the use of smaller sealed beam headlamps, replaceable light source headlamps and lower mounting height. All of these changes should give manufacturers greater design freedom to achieve lower aerodynamic drag and some weight reductions, which could have positive impacts on CAFE. However, the agency does not have any data to estimate the reduction in drag that may be economically achievable for light trucks as a result of these changes. These positive effects may be counterbalanced by possible slow consumer acceptance of light truck styling for certain models which have been influenced by aerodynamic considerations. However, Ford indicated in its comments on the fuel economy NPRM that the changes to Standard 108 may permit more aerodynamic front end designs, and provide some opportunity for weight reduction.

The agency is considering whether to propose requiring new light trucks to be equipped with Center High Mounted Stop Lamps (CHMSLs). However, it is unlikely at this time that NHTSA would propose to make the requirement effective in MY 1992. Ford noted in its comments that if such a requirement were adopted, it would result in a weight increase of approximately two pounds.

FMVSS 216. On November 2, 1989 (54 FR 46275), NHTSA published an NPRM proposing to extend the roof crush protection requirements of Standard No. 216 to light trucks and multipurpose passenger vehicles with GVWRs of 10,000 pounds or less, with a proposed effective date of September 1, 1991. The NPRM estimated that there is already widespread

voluntary compliance with the requirements of Standard No. 216. NHTSA tentatively concluded in the fuel economy NPRM that since essentially all vehicles already comply with the proposed requirement, and only modest increases are anticipated for the few vehicles which do not meet the proposed performance levels, the extension of Standard No. 216 to light trucks is not expected to affect MY 1992 fuel economy capabilities.

In its response to the fuel economy NPRM, Ford commented that while most trucks meet the proposed crush standards, the roofs of most truck *lines* must be changed to enable all trucks to comply with the proposed standard. Ford estimated that this would add 2 to 10 pounds to the weight of affected vehicles. GM indicated that certain of its vehicles already comply, and that most other models would suffer a weight penalty of nine pounds. Chrysler provided no specific estimate on the impacts of complying with the roof crush requirements.

Because each of the companies has included the effect of FMVSS 216 in its fuel economy projection, no adjustment to manufacturer fuel economy projections is needed to account for the impact of this standard.

FMVSS 214. On December 22, 1989, the agency published an NPRM (54 FR 52826), proposing to extend the existing side-door strength requirements of Standard No. 214 to trucks, buses and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less, effective September 1, 1992.

NHTSA has estimated that the proposal, if adopted, could result in an average weight increase of 18–20 pounds per vehicle not including possible secondary weight, or 31–35 pounds including possible secondary weight. If the requirement takes effect as proposed, it would have no impact on MY 1992 fuel economy capabilities, except for new model introductions in prior model years that were designed to meet the proposed requirements. No manufacturers raised compliance with Standard 214 as having an impact on MY 1992 CAFE levels.

Vehicle classification. NHTSA proposed to establish a new vehicle classification system for determining the applicability of the Federal Motor Vehicle Safety Standards on October 17, 1988. (53 FR 40463). The proposed rule would not affect the classification of vehicles for fuel economy standards. The agency is not proposing to alter the definitions of "passenger automobile" or "light truck" as they appear in 49 CFR Part 523. However, vehicles that are defined as light trucks for the purpose of fuel economy standards would be the type of vehicle most affected by the proposed classification changes. Vehicles classified as light trucks for fuel economy standards include many vehicles currently classified as trucks or MPVs for the purpose of safety standards. However, as the agency proposed to amend its safety regulations in such a way as to ensure that re-classification, by itself, caused no change in the applicability of safety standards, adoption of the proposed classification rule would have no impact on manufacturers' fuel economy capabilities for MY 1992.

2. Noise Standards

The agency is not aware of any plans on the part of EPA to promulgate noise regulations during the MY 1992 time period, and therefore does not anticipate any attendant fuel economy impacts.

3. Emission Standards

Because of the pending legislation to amend the Clean Air Act, the potential fuel economy impact for a number of possible environmental requirements cannot be determined at this time. The primary impacts of the requirements contained in the proposed legislation would be concentrated in MY 1994 and later years. The Environmental Protection Agency (EPA) has two rulemakings either in progress or completed which could impact light truck fuel economy during MY 1992. These include a final rule addressing diesel particulate matter, and a proposed rule addressing evaporative emissions.

Diesel Particulate Matter. On October 31, 1988, EPA published a final rule at 53 FR 43870 amending the particulate standards for light duty diesel trucks with a loaded vehicle weight of more than 3,750 pounds. The amended standard is 0.13 gm/mi for model years 1991 and beyond. This rule was the result of a proposal in response to a petition from GM which outlined a plan to develop control technology to substantially reduce particulate emission from current control levels. However, in its comments on the MY 1990–91 proposed light truck standards, GM indicated that it did not know what effect on fuel economy would result from the EPA rulemaking, but stated that ". . . any required technology such as a particulate trap may adversely impact fuel economy." GM's MY 1992 light truck CAFE projections, however, do not indicate that the new standard is responsible for any loss of fuel economy. Thus, NHTSA has not made any adjustment to GM's fuel economy estimates to reflect the more stringent particulate standard. Neither Chrysler nor Ford have raised concerns about the fuel economy impact of the new standard.

Evaporative emissions. On January 19, 1990, EPA issued an NPRM proposing modifications to test procedures for control of evaporative emissions from running losses (55 FR 1914). This proposal would affect light duty vehicles fueled by gasoline or methanol. In its comments on the fuel economy NPRM, Chrysler mentioned a potential fuel economy pen-

alty for on-board vapor recovery. Since it appears unlikely that the requirements, if adopted, would go into effect by MY 1992, this impact has not been considered for purposes of this final rule.

4. EPA Test Procedures

Gear shift indicator lights. During the MY 1990–91 fuel economy rulemaking, EPA issued a letter to manufacturers proposing to eliminate one of the two methods currently authorized to determine the fuel economy benefits of shift indicator lights. These dashboard lights are designed to inform drivers about the optimal speed, from a fuel economy standpoint, for shifting gears. EPA proposes to eliminate the driver usage rate survey, the method preferred by GM as a "more representative credit for actual shift indicator light usage than the on-road survey," and allow only an on-road shift light survey. At this point, EPA has not made a decision on this issue. No manufacturers raised the issue of shift indicator lights in their comments in response to NHTSA's request for comments on manufacturers' MY 1992–94 light truck fuel economy capabilities. In its comments on the MY 1992–94 fuel economy NPRM, GM stated that its light truck CAFE could be adversely affected if EPA were to eliminate the driver usage rate survey. However, since EPA has not made a decision on the issue, NHTSA has not made any adjustment to fuel economy capabilities to consider this factor.

5. Other Standards

Asbestos. On January 29, 1986, EPA proposed to prohibit the "manufacture, importation, and processing of asbestos in certain products," and the phasing out of asbestos in all other products. The implication of this rulemaking for motor vehicles would be to eliminate the use of asbestos in brake linings, clutch facings, automatic transmissions and gaskets.

On July 12, 1989, EPA published a final rule (54 FR 29460) phasing in a prohibition of asbestos in almost all products. Asbestos brake linings are banned for use by original equipment manufacturers effective MY 1994. Asbestos clutch facings, automatic transmission components and virtually all asbestos gaskets are banned as of August 25, 1993. In its comments on the MY 1990–91 light truck fuel economy rulemaking, GM indicated that the phase out would increase vehicle weight approximately 5 pounds and reduce CAFE. However, GM provided no substantiation for its estimates. In response to NHTSA's request for comments on MY 1992–94 manufacturers' CAFE capabilities, no manufacturer indicated that this rule would have any potential impact on MY 1992 light truck fuel economy. However, in its comments on the fuel economy NPRM, GM indicated that while most necessary changes had been implemented, and therefore are included in the company's CAFE projections, certain changes had not yet been made. Specifically, the company anticipates a seven pound increase on the S/T models beginning in MY 1992. This increase will have a negligible impact (less than .01 mpg) on GM's MY 1992 capability. Because Ford is the least capable manufacturer for MY 1992, this has no impact on the level of the standard.

V. The Need of the Nation to Conserve Energy

The United States imported 15 percent of its oil needs in 1955. The import share had reached 35.8 percent by 1975, the year the Energy Policy and Conservation Act was passed, and peaked at 46.5 percent in 1977, at a cost of $74 billion (stated in 1988 dollars). While the import share of total petroleum supply declined after that year, the cost continued to rise to a 1980 peak of $102 billion (1988 dollars).

While the import share of petroleum supply declined through 1985, it has been increasing since that time. In 1985, the import share was 27.3 percent at a cost of $50 billion (1988 dollars). For 1988, net imports were 37.0 percent of total supply. For 1989, net imports were 43.5 percent of total supply. For January 1990, net imports reached 47.1 percent of total supply. Due to sharply lower petroleum prices, however, the value of imports declined from 1985 to 1988, from $50 billion to $37 billion (1988 dollars). Imports from OPEC also declined through 1985 but have been rising since that time. For 1989, OPEC imports accounted for about 52 percent of total import supply, up from almost 48 percent for 1988.

The nation's dependence on petroleum net imports since 1975 is summarized in the following table:

Year	Net Imports as Percent of U.S. Petroleum Products Supplied	
	From OPEC	From All Countries
1975 Average	22.6%	36.8%
1977 Average	33.5	46.4
*	*	*
1985 Average	12.3	28.7
1988 Average	21.5	40.2
1989 Average	25.2	43.5

The current energy situation and emerging trends point to the continued importance of oil conservation. The United States now imports a higher percentage of its oil needs than it did during 1975, the year EPCA was passed, and the percentage of its oil supplied by OPEC is similar to that of 1975. Oil continues to account for well over 40 percent of U.S. energy use, and 97 percent of the energy consumed

in the transportation sector. While the U.S. is the second-largest oil producer, it contains only three percent of the world's proved oil reserves. Moreover, proved reserves in the U.S. have declined from a peak of 39 billion barrels in 1970 to 27 billion barrels in 1987.

According to the Energy Information Administration's (EIA) 1989 Annual Energy Outlook, domestic production for its "base case" projection is expected to decline from 10.5 MMB/D in 1988 to 8.6 MMB/D in 1995, and 8.5 MMB/D in 2000. Net imports are projected to increase from 6.3 MMB/D in 1988 to 9.3 MMB/D in 1995 and 10.2 MMB/D in 2000. Thus, as a percentage of total U.S. petroleum use, EIA expects imports to rise to 52 percent of total supply in 1995 (exceeding the previous 1977 high of 46.4 percent) and 55 percent in 2000.

In its comment to the docket for NHTSA's 1990 passenger car CAFE rulemaking, the Department of Energy (DOE) emphasized several points about transportation's role in U.S. oil use and the importance of rising fuel efficiency. DOE noted that the 11 MMB/D used by the transportation sector in 1986 is almost 80% of total U.S. fuel use of oil and over 90% of the critical light product use. Thus, DOE wanted NHTSA to consider the fact that any significant moderation in growing oil demand will require large transportation efficiency improvements. DOE also emphasized that the 1987 EIA oil demand forecasts assume that average new car efficiency will continue to improve, which DOE said does not seem likely given fuel economy trends (at least to the levels assumed by EIA), and that even with these projected increases in fuel efficiency, U.S. oil demand is projected to increase over 1.5 MMB/D by 2000.

The level of petroleum imports is only one aspect of the total energy conservation picture. Under EPCA and NEPA, for example, national security, energy independence, resource conservation, and environmental protection must all be considered.

In March 1987, the Department of Energy submitted a report to the President entitled "Energy Security." NHTSA believes that the following quotation from that report represents a useful summary of the national security and energy independence aspects of the current energy situation:

> Although dependence on insecure oil supplies is . . . projected to grow, energy security depends in part on the ability of importing nations to respond to oil supply disruptions; and this is improving. The decontrol of oil prices in the United States, as well as similar moves in other countries, has made economies more adaptable to changing situations. Furthermore, the large strategic oil reserves that have been established in the United States (and to a lesser extent, in other major oil-importing nations) will make it possible to respond far more effectively to any future disruptions than has been the case in the past.
>
> The current world energy situation and the outlook for the future include both opportunities and risks. The oil price drop of 1986 showed how consumers can be helped by a more competitive oil market. If adequate supplies of oil and other energy resources continue to be available at reasonable prices, this will provide a boost to a world economy. At the same time, the projected increase in reliance on relatively few oil suppliers implies certain risks for the United States and the free world. These risks can be summarized as follows: If a small group of leading oil producers can dominate the world's energy markets, this could result in artificially high prices (or just sharp upward and downward price swings), which would necessitate difficult economic adjustments and cause hardships to all consumers.
>
> Revolutions, regional wars, or aggression from outside powers could disrupt a large volume of oil supplies from the Persian Gulf, inflicting severe damage on the economies of the United States and allied nations. Oil price increases precipitated by the 1978–79 Iranian revolution contributed to the largest recession since the 1930's. Similar or larger events in the future could have far-reaching economic, geopolitical, or even military implications.

Light truck registrations nearly doubled between 1973 and 1986 and light truck sales are projected to increase 21 percent over the 1987–2000 period, compared to 14 percent for passenger cars. The light truck fleet's share of total oil consumption increased steadily from 6.4 percent in 1973 to 8.9 percent in 1980 to 12.1 percent in 1986 and to 12.3 percent in 1988. This increase in the light truck fleet's share of fuel consumption took place even as the average fuel economy of the on-road fleet of light trucks increased from an estimated 10.5 mpg in 1973 to 13.4 mpg in 1988. Clearly, light truck fuel economy will be an increasingly important determinant of the nation's level of petroleum consumption.

Information provided to NHTSA by the Department of Energy indicates that light trucks last longer (14.9 years versus 10.9 years) than passenger cars. Federal Highway Administration data indicate light trucks are driven farther annually (11,846 miles versus 10,119 miles) than passenger cars.

All of these factors result in the conclusion that improved light truck fuel economy contributes to the nation's efforts at conserving fuel. Light trucks meeting the standards proposed by this notice would be more fuel-efficient than the average vehicle in the

current light truck fleet in service, thus making a positive contribution to petroleum conservation.

VI. Determining the Maximum Feasible Average Fuel Economy Level

As discussed above, section 502(b) requires that light truck fuel economy standards be set at the maximum feasible average fuel economy level. In making this determination, the agency must consider the four factors of section 502(e): technological feasibility, economic practicability, the effect of other Federal motor vehicle standards on fuel economy, and the need of the nation to conserve energy. As with earlier CAFE rulemakings, NHTSA has considered and weighed all four statutory factors of section 502(e) in reaching its decision.

A. *Interpretation of "Feasible"*

Based on definitions and judicial interpretations of similar language in other statutes, the agency has in the past interpreted "feasible" to refer to whether something is capable of being done. The agency has thus concluded in the past that a standard set at the maximum feasible average fuel economy level must: (1) be capable of being done and (2) be at the highest level that is capable of being done, taking account of what manufacturers are able to do in light of technological feasibility, economic practicability, how other Federal motor vehicle standards affect average fuel economy, and the need of the nation to conserve energy.

B. *Industrywide Considerations*

The statute does not expressly state whether the concept of feasibility is to be determined on a manufacturer-by-manufacturer basis or on an industrywide basis. Legislative history may be used as an indication of Congressional intent in resolving ambiguities in statutory language. The agency believes that the below-quoted language provides guidance on the meaning of "maximum feasible average fuel economy level."

The Conference Report to the 1975 Act (S. Rep. No. 94-516, 94th Cong., 1st Sess. 154-5 (1975)) states:

> "Such determination [of maximum feasible average fuel economy level] should take industrywide considerations into account. For example, a determination of maximum feasible average fuel economy should not be keyed to the single manufacturer which might have the most difficulty achieving a given level of average fuel economy. Rather, the Secretary must weigh the benefits to the nation of a higher average fuel economy standard against the difficulties of individual manufacturers. Such difficulties, however, should be given appropriate weight in setting the standard in light of the small number of domestic manufacturers that currently exist, and the possible implications for the national economy and for reduced competition association (sic) with a severe strain on any manufacturer. . . ."

It is clear from the Conference Report that Congress did not intend that standards simply be set at the level of the least capable manufacturer. Rather, NHTSA must take industrywide considerations into account in determining the maximum feasible average fuel economy level.

NHTSA has consistently taken the position that it has a responsibility to set light truck standards at a level that can be achieved by manufacturers whose vehicles constitute a substantial share of the market. See 49 FR 41251, October 22, 1984. The agency did set the MY 1982 light truck fuel economy standards at a level which it recognized might be above the maximum feasible fuel economy capability of Chrysler, based on the conclusion that the energy benefits associated with the higher standard would outweigh the harm to Chrysler. 45 FR 20871, 20876; March 31, 1980. However, as the agency noted in deciding not to set the MY 1983-85 light truck standards above Ford's level of capability, Chrysler had only 10-15 percent of the light truck domestic sales, while Ford had about 35 percent. 45 FR 81593, 81599; December 11, 1980.

C. *Petroleum Consumption*

The precise magnitude of energy savings associated with alternative light truck fuel economy standards is uncertain. The FRIA provides calculations for the hypothetical lifetime fuel consumption of the MY 1992 domestic light truck fleets assuming those same fleets could and would achieve alternative CAFE levels. For example, assuming that manufacturers could achieve an average CAFE of 21.0 mpg for the MY 1992 domestic light truck fleet but instead achieved 20.2 mpg with the same number of sales, there could be a maximum difference in fuel consumption of 638 million gallons over the lifetime of the model year's fleet.

However, it is possible that manufacturers may be able to achieve particular higher CAFE levels only by restricting the sales of their large light trucks. If this occurred, consumers might tend to keep their older, less-fuel efficient light trucks in service longer. Also, to the extent that a particular manufacturer might find it necessary to restrict sales of its large light trucks, consumers may be able to transfer their purchases of those same types of vehicles to another manufacturer which may have less difficulty meeting the CAFE standard. Thus, the agency believes that the actual impacts, if any, on energy consumption of alternative higher fuel economy standards, would be less than the theoret-

ical calculations comparing different levels of industrywide CAFE.

D. The MY 1992 Standards

Based on its analysis described above and on manufacturers' projections, the agency concludes that the major domestic manufacturers can achieve the combined fuel economy levels listed in the following table:

Manufacturer	Approximate market share (MY 1989)	Combined CAFE
Chrysler	21.0%	21.2 mpg
GM	33.0%	20.8 mpg
Ford	26.0%	20.2 mpg

As indicated above, foreign manufacturers other than Volkswagen and Land Rover compete in only the small vehicle portion of the light truck market and are therefore expected to achieve CAFE levels well above those of GM, Ford and Chrysler, which offer full ranges of light truck models.

Unlike past years, the agency is not setting separate 2WD and 4WD standards as an alternative to the combined standard. The agency's decision on this issue is discussed in detail below.

The setting of maximum feasible fuel economy standards, based upon consideration of the four required factors, is not a mere mathematical exercise but requires agency judgment. Based on the preceding analysis and discussion, the agency concludes that Ford is the least capable manufacturer with a substantial share of sales and that 20.2 mpg is the maximum feasible combined standard for the 1992 model year. For the reasons discussed below, this level balances the potential petroleum savings associated with higher standards against the difficulties of manufacturers facing potentially higher standards.

Notwithstanding the projected product plans that the manufacturers have provided the agency and that are discussed, there is the potential for some decline in each manufacturer's CAFE. The above analysis has not covered the potential of mix shifts because of the possible adverse financial consequences to manufacturers and national employment of any large change in CAFE that is created by forced mix shifts. Nevertheless, the market may dictate changes in the light truck mix in response to fuel prices and availability. Continuing low fuel prices and plentiful supply may result in an increased demand for power and performance, while an unanticipated substantial increase in fuel prices could increase demand for more fuel-efficient models.

NHTSA believes there are serious questions whether a standard set at a level above Ford's capability would be consistent with the requirement that standards be set taking industrywide considerations into account, given that company's market share.

The precise effects on petroleum conservation of a higher standard are uncertain. The maximum theoretical additional energy savings associated with a standard set at a higher level can be determined by comparing hypothetical situations where GM and Ford would have combined average fuel economy levels of 21.0 mpg. Since most other manufacturers in the industry project MY 1992 CAFE above that of GM's capability, a standard set at 21.0 mpg would not be expected to affect the petroleum consumption of trucks manufactured by that part of the industry. The maximum difference in total gasoline consumption between these two hypothetical situations over the lifetime of the MY 1992 fleet would be 638 million gallons. The maximum yearly impact on U.S. gasoline consumption would be 74 million gallons, or roughly six hundredths of one percent of total motor vehicle gasoline consumption.

The agency believes, however, that any gasoline savings associated with a higher standard would actually be less than indicated by this projection. While such a standard would provide added incentive for GM to achieve its maximum fuel economy capability, it is not clear in light of earning possible carryforward/carryback credits that they might not achieve this increase anyway. Ford could not likely improve its CAFE other than by restricting sales of its larger light trucks and engines. To the extent that would-be purchasers of such vehicles and engines transferred their purchases to GM and Chrysler without those companies otherwise changing their product plans, there could be little or no effect on overall petroleum consumption.

A higher standard than 20.2 mpg could result in serious economic difficulties for Ford. Given leadtime constraints, NHTSA believes that the primary potential fuel-efficiency enhancing actions that Ford or any other manufacturer would consider in response to a higher standard would consist of marketing actions. For the reasons discussed earlier in this notice, however, the agency does not believe that marketing actions can be relied upon to significantly improve fuel economy. If such marketing actions were unsuccessful in whole or in part, Ford would likely have to engage in product restrictions, including limiting the sales of larger engines and/or vehicles to improve its fuel economy. Such product restrictions could result in adverse economic consequences for Ford, its employees and the economy as a whole and limit consumer choice, especially with regard to the load carrying needs of light truck purchasers.

Given Ford's 26 percent share of the light truck market in MY 1989, its capability has a significant

effect on the level of the industry's capability and, therefore, on the level of the standards. The agency believes that the 20.2 mpg standard balances the potentially serious adverse economic consequences associated with market and technological risks against potential fuel economy improvements. The agency concludes, in view of the statutory requirement to consider specified factors, that the relatively small and uncertain energy savings associated with setting a standard above Ford's capability would not justify the potential economic harm to that company and the economy as a whole.

In addition to the comments discussed above, the agency received comments from Nissan, the Natural Resources Defense Council (NRDC), the Energy Conservation Coalition (ECC), the Western Interstate Energy Board (WINB) and the National Automobile Dealers Association (NADA).

The ECC, in comments endorsed by NRDC, argued that in setting the CAFE standards, NHTSA should double the 3% annual rate of increase provided by the high end of the ranges proposed. This would result in a MY 1992 CAFE of 22.2 mpg, and an MY 1994 CAFE of 25 mpg. The ECC also stated it is essential to set standards now for model years after 1994 to provide manufacturers with adequate leadtime to achieve higher fuel economy levels. The comments claimed these increases would be cost-effective, and listed a number of potential technological improvements available to manufacturers. Finally, ECC provided statistics on the potential fuel savings achievable through higher CAFE standards for light trucks, and emphasized the U.S. transportation sector's role as a source of greenhouse gas emissions.

ECC does not explain the basis for their suggested levels. The commenter did not demonstrate why these levels would be feasible. As explained above, the agency has determined that the maximum feasible level for MY 1992 is 20.2 mpg. In addition, the short statutory deadline makes it impractical for the agency to set standards beyond MY 1992 at this time. NHTSA also notes that much of the technology listed in ECC's comments has already been extensively incorporated in the light truck fleet. The agency has included an analysis of carbon dioxide emissions associated with this CAFE standard in the Environmental Assessment prepared by the agency for this rulemaking and available from the Docket Section. Finally, the agency notes that the fuel economy levels and time frames for their implementation advocated by ECC exceed the scope of the NPRM.

NRDC, while endorsing the ECC comments, also expressed concern that the NPRM did not discuss NHTSA's decision to undertake a programmatic Environmental Impact Statement (EIS) to examine effects of the CAFE program. NRDC believes the agency's handling of fuel economy issues violates the National Environmental Policy Act, and that the agency has not adequately analyzed the relationship between fuel efficiency and carbon dioxide emissions. In response, NHTSA notes that it has provided an analysis of fuel economy and carbon dioxide emissions in its Environmental Assessment for this rulemaking, and is continuing its work toward the publication of a programmatic EIS for the CAFE program. To that end, the agency has issued a notice of intent to prepare a programmatic EIS (54 FR 37702, September 12, 1989), and is currently analyzing comments received in response to that notice.

WINB supports higher fuel economy standards than those proposed, although it does not provide specific levels. The comments note that the growing role of light duty trucks is a primary cause of the stagnation in the fleetwide CAFE of all light duty vehicles. WINB argues that the agency has not considered the economic implications of failing to increase light truck CAFE, and that domestic jobs will be lost as rising fuel prices shift demand toward more efficient, imported light trucks.

NHTSA believes that it has taken into account the economic implications of not setting higher standards. This issue is discussed in detail in the FRIA available from the Docket. The agency disagrees with WINB's assumption that significantly higher fuel prices are likely during the period affected by this rulemaking, and that this will result in significantly increased demand for more fuel-efficient vehicles. See the FRIA for a more detailed discussion of future fuel prices. The agency also disagrees that domestic jobs will be lost as a result of its decision. In response to apparent consumer demands, import manufacturers are now introducing larger, more powerful and less efficient light trucks. This trend gives no indication of reversing in the near future. Finally, the agency notes that promulgation of standards beyond the range proposed in the NPRM exceeds the scope of this rulemaking.

NADA recommended that the agency establish CAFE standards no higher than 20.2 mpg. This is the maximum feasible level in NADA's opinion, because of new regulatory constraints and the need to accommodate a wide range of consumer needs for utility and durability. NADA stated that NHTSA appears to have underestimated the potential impact of safety and emissions standards for MY 1992–94, although no specific data were provided.

NHTSA notes that, as discussed above, emissions impacts stemming from the pending Clean Air Act amendments are not anticipated until MY 1993 at the earliest. The agency also believes that its anal-

ysis has adequately accounted for the CAFE impacts of safety requirements affecting the MY 1992 fleet.

In its comments, Nissan projected that it would be in compliance with the upper end of the ranges proposed in the NPRM, and was thus not opposed to their adoption.

NHTSA has decided not to promulgate for MY 1992 the optional separate 2WD/4WD standards that have been promulgated for previous model years. A single combined standard is being issued instead. NHTSA is concerned that retaining the separate standards may actually decrease fuel economy by encouraging the production of the less fuel-efficient 4WD vehicles by full line manufacturers since these vehicles would not be averaged with 2WD trucks for compliance.

Separate 2WD and 4WD standards were originally intended to provide an alternative means of compliance to manufacturers that manufactured primarily 4WD vehicles that would reflect the specialized nature of their fleets without undue penalty. Since the separate standards were established, the manufacturers that were served by this system, American Motors and International Harvester, have, respectively, been acquired by Chrysler and stopped manufacturing light trucks. Thus, the original intended beneficiaries of the separate standards have disappeared.

The combined standard is a benefit to any manufacturer making predominantly 2WD models. It is a disadvantage to a manufacturer whose fleet consists entirely or mostly of 4WD vehicles. It is intended to take into account manufacturers that typically have a fleet with a majority of 2WD vehicles. NHTSA notes that there are only four manufacturers currently marketing fleets of predominantly 4WD vehicles. These are Daihatsu, Suzuki, Subaru and Range Rover. In MY 1990, Daihatsu, Suzuki and Subaru exceed by substantial margins the MY 1992 combined standard as well as the MY 1990 2WD standard by virtue of their fleets of small, fuel efficient models. Range Rover, on the other hand, does not meet the MY 1990 4WD standard because it markets only a single model, a 4WD utility vehicle with a fairly large engine. In contrast to the circumstances that existed in 1980, when American Motors and International Harvester had a combined share of just over 7 percent of the light truck market, Range Rover's projected share of the market for MY 1990 is much less than one percent. Range Rover's limited participation in the U.S. market does not warrant establishing separate 2WD and 4WD standards.

At present, most domestic and most import manufacturers choose to comply with the single, combined standard instead of the separate 2WD and 4WD standards.

Chrysler supported NHTSA's proposed decision to eliminate the separate 2WD and 4WD standards. Ford expressed no objection to the proposal, and NADA took no position on the issue. GM opposed the proposal on grounds that it would restrict full-line manufacturers' flexibility in complying with the light truck standard. The company stated that the separate standards moderate the adverse CAFE impact of increased consumer demand for 4WD vehicles.

NHTSA does not agree that separate standards are necessary to provide full-line manufacturers with flexibility. As noted above, the original intention behind the separate standards was to enable specialized manufacturers to more easily comply with the standards. The separate standards no longer serve this purpose. The agency believes that it already properly accounts for the potential increasing relative demand for 4WD vehicles and the resulting CAFE risks and potential mix effects when it sets the combined standard. Moreover, manufacturers are provided with flexibility in complying with the standard through the use of carryforward and carryback credits.

Based on these considerations, NHTSA has determined that the separate standards are no longer necessary. Accordingly, the MY 1992 standard contains only a combined standard for light trucks.

Manufacturers that have earned credits in past model years by complying with the separate 2WD and 4WD standards would still be able to use those credits to offset CAFE shortfalls within the three year carryforward period. *See,* 45 FR 83233 (December 18, 1980) and 44 FR 64943 (November 8, 1979).

In its March 1989 response to NHTSA's request for comments, Volkswagen suggested as an alternative to establishing a combined standard within its capability that the agency consider alternate special consideration for limited product line truck manufacturers. In establishing the MY 1980–81 light truck CAFE standards, the agency did establish a separate standard in light of International Harvester's (IH) limited product line. See 43 FR 11995, March 23, 1978. The agency noted that IH had unique problems given its limited sales volume, restricted product line, the fact that its engines were derivatives of medium duty truck (above 10,000 pounds GVWR) engines, and the fact that it did not have experience with state-of-the-art emission control technology which the other manufacturers had obtained in the passenger automobile market. The agency emphasized, however, that the separate class was being established for only two model years' duration, concluding that IH should be able to achieve levels of fuel efficiency in line with other manufacturers within that time period either through purchasing engines from outside sources or by making improvements to current engines. The

agency does not believe that Volkswagen's situation is similar to that of IH. While IH's difficulties were related to being newly subject to the fuel economy program, Volkswagen's potential CAFE difficulties are not. Under the Cost Savings Act, manufacturers are required to meet average fuel economy standards which are set based on industrywide considerations. For MY 1992, Volkswagen is projected to be well above the CAFE standard. Thus, NHTSA believes it is not appropriate to set a separate standard to accommodate Volkswagen's limited product line status.

PART 533—[AMENDED]

In consideration of the foregoing, 49 CFR Part 533 is amended as follows:

Table III is added to § 533.5(a) to read as follows:

§ 533.5 *Requirements.*

(a) * * *

TABLE III

Model year	Combined Standard	
	Captive Imports	Others
1992	20.2	20.2

3. § 533.5(e) will be added to read as follows:

(e) For model year 1992, each manufacturer shall comply with the average fuel economy standard specified in paragraph (a) of this section (segregating captive import and other light trucks).

Issued on March 30, 1990

Jerry Ralph Curry
Administrator

55 F.R. 12487
April 4, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment
(Docket No. 85–15; Notice 12)
RIN 2127–AC53

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: This notice responds to petitions for reconsideration of the final rule amending Motor Vehicle Safety Standard No. 108 that was published on May 9, 1989. It clarifies that High Intensity Discharge headlighting systems are not excluded as integral beam headlighting systems. Definitions of "beam contributor" and "vehicle headlamp aiming device" are adopted. Petitions asking for elimination of horizontal aim requirements are denied. Equipment marking requirements are modified to allow use of the vehicle manufacturer's name on original equipment. The lengthy informational label required by the final rule if certain aim performance is not achievable, effective June 8, 1989, has been suspended. Under requirements effective September 1, 1990, the information on the label may be shortened to a caution, provided that it refers the reader to the operator's manual for a further explanation, and provided that the manual contains such information. Finally, clarifying information has been added to the requirement for torque deflection performance for mechanically-aimed headlamps.

EFFECTIVE DATE: The final rule is effective March 12, 1990, except that the requirements of S7.7.2.1 and S7.7.5.2(b) relating to information to be provided on a label on the vehicle, and in the operator's manual are effective September 1, 1990.

SUPPLEMENTARY INFORMATION: On May 9, 1989, NHTSA published amendments to Federal Motor Vehicle Safety Standard No. 108 *Lamps, Reflective Devices, and Associated Equipment* (Notice 8, 54 FR 20066). In a pertinent part, NHTSA added a new category of headlamps without dimensional requirements, known as "integral beam headlamps". An on-vehicle mechanical aim alternative to existing off-vehicle mechanical aim was also adopted. Subsequently, on July 19, 1989, NHTSA published technical amendments to the rule (Notice 9, 54 FR 30223). Thereafter, on August 1, 1989, NHTSA published an interim final rule establishing a new effective date of December 1, 1989, for downward torque deflection requirements, and requested comments on its action (Notice 10, 54 FR 31687). In response to comments to that notice, the effective date was further delayed to September 1, 1990 (Notice 11, 54 FR 49296).

Petitions for reconsideration of various aspects of the amendment were filed by Ford Motor Company (Ford), General Motors Corporation (GM), Motor Vehicle Manufacturers Association (MVMA), Volkswagen of America (VW), and Koito Manufacturing Co., Ltd. (Koito). Chrysler Corporation adopted by reference the petition submitted by MVMA.

Discussion of Petitions
Issues Relating to Integral Beam Headlamp Systems

Paragraph S7.4 specifies requirements for integral beam headlamp systems. The intent of this new specification is to allow design freedom in meeting the photometric requirements specified by Standard No. 108. The design freedom permitted is wide enough to encompass headlamp systems of no specified dimensions, or systems in which more than one "beam contributor" combines to provide an upper or lower beam. However, some of the language adopted has been viewed as design restrictive. For example, section S7.4(f) contains the beam requirements for headlamps containing a single "filament", and section S7.4(l)(viii), in establishing criteria for the vibration test, requires no evidence of loose or broken parts other than "filaments". The High Intensity Discharge (HID) headlamps currently under development, and which may be offered on motor vehicles in the near future, do not contain filaments. Thus, the question arises whether NHTSA has impliedly excluded HID headlamps as an integral beam headlamp system by its use of the word "filaments". NHTSA did not intend to exclude HID systems, and has amended the two sections mentioned above, and

section S5.5.9 as well, to remove any language that might be interpreted as barring HID systems.

VW recommended that the term "beam contributor" be defined. The agency concurs in this recommendation and a definition is added to section S4 to specify that a beam contributor is "an indivisible optical assembly, including lens, reflector, and light source, that is part of an integral beam headlamp system and contributes only a portion of a headlamp beam."

Koito requested reconsideration of the application of the photometric performance of S7.4(a)(2) to headlighting systems other than integral beam systems. This section allows an exception to the performance of Figure 15. Koito argues that the exception should also be provided for the Type F sealed beam system, and to four-lamp replaceable bulb headlighting systems.

In implementing the performance of Figure 15, and the allowance that the lower beam could remain activated during upper beam use, the test point values were specifically adjusted to assure that two goals could be achieved. The first is that upper beam foreground illumination would not be any brighter, relative to down-the-road light, than existing headlamp systems. The second is that the upper beam headlamp could achieve photometric compliance without the aid of the lower beam lamp. The exception provided by S7.4(a)(2) specifically addressed GM's 55 × 135 mm integral beam headlamp system. The lamp that would normally provide the upper beam in that system is too small to achieve compliance alone; it must have the light emitted by the lower beam in order that the headlighting system achieve upper beam compliance.

If such an exception were allowed for the existing Type F sealed beam system, the result could be headlamps interchangeable in size, but without a corresponding identicality in photometric performance. This could result in deficient upper beam performance that does not meet the need for safety. Therefore, NHTSA has decided not to extend the excepted performance of S7.4(a)(2) to other headlighting systems, and to deny Koito's petition.

Issue Relating to Replaceable Bulb Headlamp System

Sections S7.5(d)(1) and (e)(1) provide that there shall be no mechanism that allows adjustment of an individual light source in a replaceable bulb headlamp system, or, if there are two light sources, individual adjustment of each reflector. Koito regards the sections as imposing a design restriction, and that there is no need for it. Because Standard No. 108 now permits on-vehicle aiming as an option vehicle headlamp aiming device, the agency should not prohibit two reflectors with VHADs within a single headlamp housing.

The intent of the two sections is to assure that replaceable bulb headlamps that are mechanically aimable using lens-mounted aiming pads have an unalterable relationship between the light source, reflector, lens, and aiming pads. This requirement is still required for headlamps that use external aiming devices as required by S7.7.5.1. By amending the two sections to restrict them to headlamps meeting the external aiming requirements of S7.7.5.1, the agency recognizes the validity of Koito's argument, and grants its petition.

Issues Relating to Aimability Performance Requirements

Major amendments were adopted in May regarding headlamp aimability and aim. A number of petitions asked for reconsideration of certain of the new requirements of section S7.7 *Aimability Performance Requirements.*

Section S7.7.2 called for vehicles to be equipped with on-board headlamp aiming devices, and used the term VHAD (vehicle headlamp aiming device) in reference to them. The amendment did not define the term. Questions have arisen as to whether the VHAD must be integral with the headlamp or headlamp assembly, or whether a detachable VHAD is permissible. The intent of the requirement is that the VHAD be a permanent part of the vehicle, and not separable from it. Thus, the VHAD may be integral with the headlamp, or separate from it but integral with the headlamp assembly or the vehicle, but it may not be removable for storage in the vehicle or elsewhere when not in use. Accordingly, the agency is adopting a definition for VHAD and correcting ambiguous language in order to clarify its intent.

The VHAD measures both horizontal and vertical aim of the headlamp. The requirements for horizontal aimability and the capability of the VHAD were objected to by GM, MVMA, and Ford. MVMA termed this "our most serious concern with Notice 8". It cites previous arguments in support of the deletion of horizontal aimability requirements from Standard No. 108, arguing that "design can be employed wherein horizontal aim will not vary during the normal course of a vehicle's life, nor will it vary upon headlamp replacement, thereby obviating the need for horizontal aimability." Ford believes that the agency has overstated its concern with the adverse effects of glare, resulting from improper horizontal aim.

Specifically, section S7.7.2 requires all headlamps to be aimable in the vertical and horizontal axes. Section S7.7.4 specifies a horizontal aim adjustment range when a headlamp is tested in a laboratory.

Ford, claiming that these requirements are unnecessarily restrictive for a manufacturer who can assemble cars within a stringent horizontal aim tolerance, would add an exception to these sections. A manufacturer would have the option of installing headlamps with a mounting and aiming mechanism that provides only vertical aim adjustment, if, in addition, the headlamps as installed meet a horizontal aim specification of 0.0 +0.8/−0.4 degree. Ford avers that this specification is at least as stringent as any current State horizontal aim requirement.

NHTSA has reviewed the petitions by GM, MVMA, and Ford. First, the agency does not vary from its conclusion that specification and maintenance of horizontal aim requirements meet the need for motor vehicle safety. Not only is proper horizontal aim necessary to prevent glare to oncoming drivers, but it is also necessary to ensure that the roadway is illuminated by the headlamp in the manner intended to achieve the headlamp's full capability of providing light by which the operator may safely drive. NHTSA finds two fundamental areas of concern with respect to arguments against horizontal aimability.

The first is that, without the capability of horizontal aim measurement, the compliance of such a headlamp with Federal requirements for photometrics could not be verified. This lack of measurement capability could also create difficulties for owners, inspectors, and repair personnel in States which prescribe horizontal aim requirements as part of their vehicle inspection programs, since there would be no means to measure and verify the correctness of aim.

Second, although vehicles manufactured to Ford's specifications presumably could be manufactured with proper horizontal aim, circumstances can occur during the life of the vehicle that adversely affect maintenance of correct horizontal aim. Thus, the long-term safety of such vehicles that Ford and others would build, as a group, could be lower than that of vehicles which have horizontal aimability. Without horizontal aim measurement and adjustment capability, it is unclear if the accuracy of horizontal aim could be assured after repair of accident damage. Manufacturers could address this concern by providing dimensional data for precise structural alignment of the vehicle in shop manuals, and appropriate instructions for performing the necessary and potentially extensive parts replacement and vehicle reconstruction requisite for correct horizontal aim. These data would assist repair shops in reestablishing the proper relationship between parts of the VHAD and the longitudinal axis of the vehicle.

However, a VHAD with horizontal aim capability would accomplish this with far greater simplicity, reliability, and less margin for error. While dimensional data and instructions for use would also be necessary, it would apply only to the relationship of the VHAD to the longitudinal axis of the vehicle, thus permitting recalibration of the VHAD alone and not the whole vehicle. Then, the simple procedure of aligning the "0" mark on the VHAD with the alignment mark on the headlamp will indicate and achieve correct horizontal aim.

This solution exists in section S7.7.5.2(a)(2)(iv), which requires the horizontal indicator to be capable of recalibration over a movement of ±2.5 degrees relative to the longitudinal axis of the vehicle to accommodate this necessary adjustment for recalibrating the indicator due to crash damage, or after vehicle repair. Ford and others would make no provision for either recalibration of indicators or headlamp adjustment for reaim. With the May amendments, Standard No. 108 assures that all headlamps can be horizontally aimable throughout the life of the vehicle by requiring adjustability and external mechanical aimer compatibility, or aim verification hardware (VHADs) and aim hardware recalibration features. Ford's system would provide none of these for horizontal aim. For the reasons discussed above, NHTSA denies the petitions by Ford, GM, and MVMA for deletion of VHAD horizontal aimability requirements.

With respect to on-vehicle aiming, section S7.7.5.2(a)(2) requires the VHAD to have four horizontal aim graduation marks in addition to the "0" mark. In GM's view, this is superfluous since all headlamps should be aimed at the "0" mark and thus the additional marks are unnecessary. GM claims that it will manufacture certain headlamps that would not need periodic reaim, and thus there is little likelihood that the aim, if originally set to "0", should deviate in use, even with lamp replacement. GM stated that removal of the other graduations would not affect State aim requirements.

The agency disagrees with GM's statement. Removal of the graduation marks would not permit State aim inspectors to determine whether headlamps are within the State-prescribed tolerances. Thus, any vehicle headlamp not aimed exactly at the "0" graduation would have to be assumed to be misaimed, even though it may in fact be within the aim range allowed by a State. This would increase the cost burden on vehicle owners, who might have to have unnecessary aim adjustments performed in order to satisfy a State that its requirements had been met. The agency also does not agree with GM that headlamps may never need reaim. Since not all persons who replace lamps are familiar with the specific procedures for replacement, many inadvertently misaim headlamps as part of the replacement process. GM has provided no evidence that would

cause the agency to believe that eliminating horizontal graduation marks, other than the "0" mark, is appropriate. Therefore, its petition for reconsideration on this issue is denied.

The VHAD's horizontal aim indicator is required to be capable of recalibration over a range of ± 2.5 degrees to accommodate the effects of crash damage and vehicle repair (S7.7.5.2(a)(iv)). GM believes this to be unnecessarily restrictive and recommended that only a means be provided to ensure that the indicator will show "0" when the headlamps are properly aimed after vehicle repair from accident damage. NHTSA observes that the wording used in this section is intended to be specific and not subject to interpretation. The language that GM suggests is subject to interpretation, and therefore may not be enforceable under all circumstances. The agency believes that under GM's language the indicator could always be made to show "0" when properly aimed after vehicle repair since the aiming procedure is to align the headlamp to the "0" mark, thus assuring correct aim. GM's request does not address the need to relocate the "0" mark if its location relative to the longitudinal axis of the vehicle has changed as a result of crash damage or repair. It implies that the "0" mark will be relocated so that it is aligned with the headlamp when the headlamp is properly aimed; however, the headlamp can be properly aimed *only* when the "0" mark has the same relationship to the vehicle longitudinal axis as originally intended by the vehicle designer, and presumably as it was manufactured. Therefore, recalibration is necessary. The range of ± 2.5 degrees is specified to limit recalibration to the range of required horizontal aimability of the headlamp. The intent was to clearly limit rather than leave open-ended, the range for recalibration, and to make that range meaningful. Therefore, this request is also denied.

Section S7.7.2 requires that aiming shall be performed without the removal of vehicle parts, except for protective covers. GM, MVMA, and Ford asked for a clarification since the section appears to prohibit the use of shims which would be added or removed for the purposes of aiming, and which would not be considered vehicle parts within the meaning of S7.7.2. NHTSA wishes to clarify that the use of shims is acceptable as long as all the necessary shims are provided with the vehicle at the time of sale. Thus, shims would be vehicle parts which would not be added to or removed from the vehicle during an aiming adjustment.

Section S7.7.2.1 requires that all headlamp systems meet certain performance requirements for independence of vertical and horizontal aim adjustments. If such performance is not possible, then an instruction label meeting the requirements of S7.7.5.2(b) shall be placed adjacent to the VHAD. Petitions were received from MVMA and GM on this issue. In GM's opinion, such a label might be so large as to cause a space problem under the hood adjacent to the VHAD. GM also said that underhood labels are not as durable as the alternative location (the owner's manual) for VHAD instructions, and that cost would increase with such a label.

Virtually all current vehicles have aiming screws that permit independent adjustment of horizontal or vertical aim. Given this fact, persons aiming headlamps on future vehicles through non-independent aiming screws would have little reason to be concerned that adjustment of one aiming screw would cause the aim in the other axis to be changed. Because increased misaim could occur through use of other than independent aiming screws, the person performing the aiming should be made aware of the proper manner to assure correct aim. Placing the label next to the VHAD was seen as the best solution. The agency concluded that service personnel would not be likely to refer to the operator's manual when performing an adjustment on new cars that they had performed many times on older ones, and thus may never become aware of the need to exercise caution about the distinctions of new on-vehicle aiming devices.

GM is correct in saying that such a label would be cumbersome if placed adjacent to the VHAD, since a label meeting the requirements of S7.7.5.2(b) would be quite large. A better solution would be to modify the label requirement, to specify a label stating only the caution specific to that particular aiming design. For example, such a label could read: "Caution—adjust horizontal aim first, vertical aim last." Such a label would be physically smaller and easier to fit adjacent to the aiming screws or VHAD. The agency, therefore, has decided to amend S7.7.2.1 to permit an alternative means of complying with the VHAD aiming instructions of S7.7.5.2(b), to allow a small label adjacent to the aiming device which would have a specific caution about aiming, provided that the label refers the reader to the operator's manual for full instructions, and provided that the full instructions are contained in the manual. This alternative responds to GM's concern. Because the label refers the reader to the manual, and because the requirement mandating information in the operator's manual is a new one, those portions of the rule will not become effective until September 1, 1990.

Section S7.7.3 requires the range of vertical aim of a headlamp installed on a vehicle to be not less than the full range of pitch of the vehicle, determinable in part by "the anticipated effects of suspension sag." Ford commented that the phrase should be eliminated from S7.7.3, since there is no reliable method

for anticipating the amount of suspension sag. It further commented that the inclusion of this requirement is unnecessary and unreasonable because such suspension changes would likely occur equally in the front and rear and thus would have little effect on pitch angle. Nor does it know of any method to determine the effects of loadings, age, environment, and road characteristics on suspension sag.

Standard No. 108's requirement for a ± 4 degree pitch range for aiming screws was intended, and continues, to take into account the myriad factors that could cause a vehicle to need a vertical aiming range substantially beyond that necessary at the time of vehicle manufacture. NHTSA believes that for the performance-oriented requirement now implemented, it is still desirable to account for anticipated sag from aging springs. Although the vehicle manufacturer would be able to give the design value assigned to accommodate the sag, the actual sag that a vehicle might exhibit could be different, as Ford claims. Therefore, verification of this added range to account for sag is not practicable since it cannot be related to actual sag during the compliance testing. Accordingly, Ford's request for deletion of "the anticipated effects of spring sag" is granted.

Ford requests that the requirement for vertical aim range in S7.7.3 be designated as a "designed to conform" requirement. Ford claims that since the design of headlamp aiming and mounting systems must be accomplished in the early stages of vehicle design, prototype vehicles are not available for testing to determine the range of pitch angle. It believes that designing the system to comply with the pitch range requirement in every manufactured vehicle may be impracticable. NHTSA believes that the vehicle manufacturing industry has the capability through computer simulation and its vast experience at designing and manufacturing vehicles to solve this design problem in many practicable ways. It is unreasonable to believe that vehicle manufacturers cannot do so, as it is also unreasonable to actually manufacture vehicles whose headlamps cannot be aimed throughout the range of pitch that a vehicle will experience in actual service. Ford's request is denied.

Ford requests a clarification that the requirement of S7.7.3 pertains only to "static pitch". Ford correctly believes that the range should apply to only static pitch situations. This was NHTSA's intent. Therefore, the word "static" has been inserted in S7.7.3, between the words "The installed range of" and "pitch angle".

In response to the interim final rule (Notice 10), several commenters stated that the torque deflection performance requirement specified by S7.7.5.1(a) is unclear with respect to the means for determining performance. The agency is revising S7.7.5.1(a) to incorporate aspects of the language on torque deflection performance contained in a forthcoming revision of SAE J1383 *Performance Requirements for Motor Vehicle Headlamps,* and information received from Ford and Hopkins Manufacturing Corporation. Ford provided data which showed that the length of the lever arm used to apply the torque affects the angular deflection. The Hopkins information provides the lever arm length for the various adapter/aimer combinations in use, and those lengths are used as minima in the text of the standard. NHTSA believes this revision will eliminate the possibility of errors in determining compliance, and the need for NHTSA interpretations relating to such testing.

Legibility requirements of the VHAD (S7.7.5.2(a)(1)(vi)) and S7.7.5.2(a)(2)(iii)) needs clarification to be more pertinent. They specify the legibility of VHAD indicators at the top of the radiator. Ford recommends that they be rewritten to specify that legibility be measured at the top of the graduations. Ford also believes that these legibility requirements should not apply to the remote reading indicator of S7.7.5.2(a)(1)(iii). However, since neither the location nor the nature of a remote reading indicator is restricted, such devices could be located under the hood, and thus the need for legibility still exists. Therefore, while NHTSA agrees with Ford as to the location for measuring the illumination (at the graduation), it disagrees with Ford's comment on restricting legibility. Appropriate changes are made to the language of S7.7.5.2(a)(1)(vi) and (a)(2)(iii) to change the location for measuring the illumination.

As noted above, neither the location nor the nature of the remote reading indicator is restricted, and such indicators could be located in the engine compartment as well as in other vehicular locations such as the instrument panel. The inclusion of a remote reading indicator was in response to Ford's comment to the initially proposed rule to permit an indicator that might be readable by the driver of the vehicle. However, questions have arisen with respect to S7.7.5.2(a)(iii) as to whether certain designs are direct or remote reading indicators. NHTSA's intent was narrow. A direct reading indicator was intended to be an indicator mounted on a headlamp or its mounting hardware. A remote reading indicator was intended to be, as Ford had envisioned, located in the instrument panel. Standard No. 108 can be interpreted as allowing a greater latitude of locations. It appears to allow both direct and indirect reading analog indicators that are not remotely mounted, both direct and indirect reading analog indicators that are remotely mounted, and the digital equivalents of these four variants. Thus, to resolve any questions which may arise, the agency is amending

section S.4 to add definitions of direct and remote reading indicators.

Issues Relating to Tests and Procedures

Ford continues to believe that S8.9, the vibration test of Standard No. 108, should be deleted, for the same reasons as stated in its comment to Notice 5 of this docket. It now recommends that the present vibration requirements apply to only heavy duty vehicles (over 80 inches or more in overall width), and that the SAE J575 JUL83 vibration requirements apply to vehicles less than 80 inches wide. Ford claims that the vibration levels of the present requirement are much higher than measured on the road by test vehicles. It also claims that the vibration levels in SAE J575 JUL83 are shown to be adequately severe in the frequency ranges of concern, compared to the data from those test vehicles. It submitted data in substantiation of its position.

NHTSA is not convinced by the Ford data comparison which includes only vibration ranges and intensities. The intent of a vibration test is to assure that lighting devices are resistant to failure from vehicle vibration. The comparison of vibration range and intensity is only part of determining a proper specification for such a test procedure. The analysis of lamp failures from the field and the replication of those failures in the laboratory are also a necessary part of the development of a proper test procedure. NHTSA's use of the present Standard No. 108 vibration test procedure has shown that failures in the test are also found in the field. The correlation between lab and field is necessary. Ford has not demonstrated that its suggested test would be any more successful in finding poorly designed lighting devices. It only has shown that its test is less severe. NHTSA remains to be convinced that a more valid vibration test exists than that already required by the standard. Therefore, Ford's petition is denied.

Ford also objects to the sealing test of S8.10, finding its conditions are excessively stringent, expensive to perform, and burdensome. It recommends a simpler 10 pounds per square inch gauge (psig), pressure test and a 10 inches of mercury vacuum test. Ford states that it has used this procedure for many years for determining lamp integrity in both development testing and in quality checks at manufacturing facilities. However, NHTSA believes that safety demands integrity of lamps not only on the day they are manufactured but while they are in service. Such basic pressure and vacuum tests do not exercise lamps under simulated conditions that reflect real world conditions. High temperatures are a normal environment for headlamps, as are low temperatures. Under those conditions, headlamps are often energized and often rapidly cooled by rainwater, causing thermal shock conditions. The rapid heating and cooling are fully intended to test the integrity of the sealing method used.

Today's headlamps no longer need to be hermetically sealed with an enclosed inert environment since such extremes are not necessary for survival of the filaments in halogen capsules. As a consequence, lenses and reflectors are adhesively bonded, which does not provide the same quality of seal as the glass to glass welding (flame sealing) used on non-halogen headlamps. Unless the design can be proven to be capable of withstanding the true vehicle environment and surviving without performance loss, it should have a seal test to prove its hermeticity. The selection of the sealing performance test is now an option of the lamp designer (S7.4(h)), choosing whether the lamp will be truly sealed by meeting S8.10, or if not, then by meeting the same requirements as unsealed headlamps (replaceable bulb types). In implementing this test requirement, NHTSA applied it to only integral beam headlighting systems, since this category of headlamps is intended to replace "sealed" beam headlamps.

An area of concern is that the present procedure may cause some laboratory safety problems for those manufacturers which may design high voltage headlighting systems known today as High Intensity Discharge systems. NHTSA will consider factual information documenting the bases for these laboratory safety concerns, if they exist, and will consider modification of those procedures to the extent that the same test results can be achieved. NHTSA is also interested in learning if such high-voltage systems would also pose safety hazards to vehicle owners and service personnel who may have to deal with such equipment in less than laboratory conditions.

Although the agency is not in favor of a less stringent sealing test, it realizes, as Ford points out, that the procedure might need changes to accommodate high test voltages. For now, however, the procedure remains in effect and Ford's request is denied.

Issues Relating to Equipment Marking

Comments were received from Ford, GM, and MVMA on the headlamp lens marking requirements of S7.2 and the standardized replaceable light source marking of S7.6(i). Ford stated that it is unclear whether the term "manufacturer" refers to only the assembler of the device or refers also and alternatively to any manufacturer of a vehicle equipped with such a device. Ford believes the latter is the more reasonable and reflects current industry practice. Ford would like this clarified to state that either the lamp manufacturer's or vehicle manufacturer's name or trademark shall be marked on the device. Ford also requests that these requirements also state that nothing in it shall be construed to authorize the use of such names or trademarks

without the owner's consent. While NHTSA's observations of the marking of headlamps does not entirely reflect that current industry practice espoused by Ford, it does agree that the requirement can be made more explicit to the advantage of all involved. The agency adopts the language requested by Ford for S7.2 and S7.6(i).

Miscellaneous Issues

In the reprinting of the Standard in May, numerous typographical errors occurred. NHTSA has corrected these errors, both in this notice and Notice 9. It has also used this notice to paragraph and designate paragraphs within sections where such appeared to contribute to the clarity of the standard.

VW found the final rule confusing in that it did not incorporate the tables and figures remaining in effect. It asked that the standard be republished in its entirety with the tables and figures, or that they be deleted, or that the agency publish a list of figures and tables remaining in effect.

To address VW's concern, NHTSA states that all numbered figures and tables remain in effect. All unnumbered figures within the text of Standard No. 108 as in effect before June 8, 1989, have been incorporated as text.

GM states that there is potential for conflict between the requirements of S5.5.8 and S5.5.9. S5.5.8 provides for the optional illumination of the lower beam headlamps on certain headlighting systems, while S5.5.9 requires that only those lamps necessary for lower beam photometrics be so wired to be energized and only those lamps necessary for meeting upper beam photometric shall be illuminated. Clearly these sections conflict. GM recommends adding the phrase "Except as provided in S5.5.8," to the beginning of S5.5.9. The agency agrees and grants this request.

Sealed beam headlighting wattages (S7.3.5 and S7.3.6) were unintentionally omitted in the final rule, as called to the agency's attention by MVMA. They have been reinserted into the standard.

Effective Dates

Because of the need to relieve design restrictions and encourage innovation, it is hereby found for good cause shown that an effective date earlier than 180 days after publication of the final rule is in the public interest, and the amendment is effective 30 days after its publication in the *Federal Register*. However, those portions of S7.7.5.2.1 and S7.7.5.2(b)(3) which impose requirements of adding a label to the vehicle, referring the reader to further information in a vehicle operator manual under the circumstances prescribed therein become effective September 1, 1990.

In consideration of the foregoing, 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

1. Definitions of "Beam contributor", "Direct reading indicator", "Remote reading indicator", and "Vehicle headlamp aiming device" are added to section S4 in alphabetical order to read as follows:

"Beam contributor" means an indivisible optical assembly including a lens, reflector, and light source, that is part of an integral beam headlighting system and contributes only a portion of a headlamp beam.

"Direct reading indicator" means a device that is mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, is part of a VHAD, and provides information about headlamp aim in an analog or digital format.

"Remote reading indicator" means a device that is not mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, but otherwise meets the definition of a direct reading indicator.

"Vehicle headlamp aiming device" or "VHAD" means motor vehicle equipment permanently installed on a motor vehicle by the manufacturer of the vehicle, which is used for determining the horizontal and vertical aim of headlamps.

2. Section S5.1.1.8 is revised by deleting the word "and" between the words "photometric" and "minimum".

3. In section S5.1.1.11, "SAE J585c" is corrected to read "SAE J586c".

4. In section S5.5.8, the reference to "paragraph S7.4(a)(2)" is corrected to read "section S7.4(a)(1)(ii)."

5. Section S5.5.9 is revised to read:

"S5.5.9 Except as provided in section S5.5.8, the wiring harness or connector assembly of each headlamp system shall be designed so that only those light sources intended for meeting lower beam photometrics are energized when the beam selector switch is in the lower beam position, and that only those light sources intended for meeting upper beam photometrics are energized when the beam selector switch is in the upper beam position."

6. Section S5.5.10 is revised by deleting paragraph (b), and redesignating paragraphs (c), (d), and (e), as paragraphs (b), (c), and (d) respectively.

7. Section S7.2 is revised to read:

"S7.2(a) The lens of each original and replacement equipment headlamp, and of each original equipment and replacement equipment beam contributor manufactured on or after December 1, 1989, shall be marked with the symbol 'DOT' either horizontally or vertically which shall constitute the certification required by 15 U.S.C. 1403.

(b) The lens of each headlamp and of each beam

contributor manufactured on or after December 1, 1989, to which paragraph (a) of this section applies shall be marked with the name and/or trademark registered with the U.S. Patent and Trademark Office of the manufacturer of such headlamp or beam contributor, or its importer, or any manufacturer of a vehicle equipped with such headlamp or beam contributor. Nothing in this paragraph shall be construed to authorize the marking of any such name and/or trademark by one who is not the owner, unless the owner has consented to it.

(c) Each headlamp and beam contributor to which paragraph (a) of this section applies shall be marked with its voltage and with its part or trade number."

8. In section S7.3.2(a)(1), a paragraph "4.1.2" is added between paragraphs 4.1.1 and 4.1.3.

9. The text of section S7.3.5 is designated section (a). A sentence designated section (b) is added to read:

"(b) The maximum wattage at 12.8 volts (design voltage): 65 watts on upper beam, and 55 watts on lower beam."

10. The text of section S7.3.6 is designated section (a). A sentence designated section (b) is added to read:

"(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on upper beam, and 60 watts on lower beam."

11. Section S7.3.7(c) is revised to read:

"(c) SAE Standard J1383 APR85 *Performance Requirements for Motor Vehicle Headlamps,* Sections 2.4, 2.5, 2.6, 4.1, 4.1.4, and 5.1.4."

12. Section S7.3.7(e)(4) is revised to read: "Sections 5.1.1.1 and 5.1.2.3 do not apply."

13. Section S7.3.7(e)(7) is revised to read:

"(e)(7) Section 5.1.6 is retitled 'Retaining Ring/Aiming Ring Tests". The phrase "92 × 150 mm . . . 0.340 in (8.6 mm)" is added at the end of the table for flange thickness. The sentence beginning "The fastening means" is deleted.

14. In section S7.3.8(b), a paragraph "4.1.2" is added between paragraphs 4.1.1 and 4.1.3.

15. In section S7.4(a)(1)(ii), the phrase "and not to the upper beam test point" is revised to read "and not to the upper beam headlamp, and the upper beam test point".

16. In section S7.4(b)(2), the word "base" is corrected to read "beam".

17. In section S7.4(c), the word "filament" is deleted and in lieu thereof the words "light source" added.

18. In section S7.4(d), and the last sentence of section S7.5(c), the word "point" is corrected to read "points".

19. In section S7.4(e), the reference to "S7.4(a)(1)" is deleted and replaced with the words "paragraphs (a)(1) or (a)(3) of this section".

20. In section S7.4(f), the phrase "paragraph S7.4(a)" is revised to read "paragraph (a) of this section".

21. In section S7.5(b), the phrase "subsections (c) through (f) below" is revised to read "paragraphs (d) and (e) of this section".

22. The first sentence of section S7.5(c) is revised to read:

"(c) The test requirements of sections 4.1, 4.1.4, and 5.1.4 of SAE J1383 APR85, using the photometric requirements specified in paragraphs (d) and (e) of this section."

23. Section S7.5(d)(1) is revised to read:

"(d)(1) Headlamps designed to conform to the external aiming requirements of S7.7.5.1 shall have no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector."

24. In section S7.5(e)(1), the introductory words "There shall be" are deleted and in lieu thereof the words "Headlamps designed to conform to the external aim requirements of S7.7.5.1 shall have" are added.

25. In section S7.5(e)(2)(ii)(B), the word "lower" is corrected to read "upper".

26. In section S7.5(i), the phrase "paragraphs S7.4(k) and (l), except that the sentence in (k)" is revised to read "sections S7.4(h) and (i), except that the sentence in (h)".

27. In section S7.6(d), the number "100" is corrected to read "1,000".

28. Section S7.6(j) is revised to read:

"(j) Each standardized replaceable light source manufactured on or after December 1, 1989, shall be marked with the symbol DOT and with a name or trademark in accordance with S7.2. In addition, the base of each such light source shall be marked with its HB Type designation."

29. In section S7.7.1, the word "vertical" is corrected to read "vehicle."

30. In section S7.7.2.1, the first sentence is designated paragraph (a). The second sentence is deleted and the following sentence, designated paragraph (b), is added in lieu thereof:

"(b) If the performance specified in paragraph (a) of this section is not achievable, the requirements of S7.7.5.2(b)(3) apply, except that if the aiming mechanism is not a VHAD, the requirements specific to VHADs are not applicable, and the instructions shall be specific to the aiming mechanism installed."

31. In the third sentence of section S7.7.3, the word "static" is added between the words "of" and "pitch", the word "truck" is corrected to read

"trunk", and the words "suspension sag and" are deleted.

32. In section S7.7.4, the first "not" is deleted.

33. In section S7.7.5.1(a), the first sentence is deleted, and the following sentences are added in lieu thereof:

"(a) The aim of the headlamps in each headlamp system, other than a headlamp system designed to conform to section S7.3, that is designed to use such external aiming devices, shall not deviate more than 0.30 degree when a downward torque of 20 lb.-in. (2.25 N-m) is removed from the headlamp in its design operating position. The downward force used to create the torque shall be applied parallel to the aiming reference plane, through the aiming pads, and displaced forward using a lever arm such that the force is applied on an axis that is perpendicular to the aiming reference plane and originates at the center of the aiming pad pattern (see Figures 4–1 and 4–3). For headlamps using the aiming pad locations of Group 1, the distance between the point of application of force and the aiming reference plane shall be not less than 6.625 in. (168.3 mm) plus the distance from the aiming reference plane to the secondary plane, if used (see section S7.7.5.1(d)(1)). For headlamps using the aiming pad locations of Group II, the distance between the point of application of force and the aiming reference plane shall be not less than 6.609 in. (167.9 mm) plus the distance from the aiming reference plane to the secondary plane, if used. For headlamps using the nonadjustable Headlamp Aiming Device Locating Plates for the 146 mm diameter, the 176 mm diameter, and the 92 × 150 mm sealed beam units, the distance between the point of application of force and the aiming plane shall, respectively, be not less than 6.984 in. (177.4 mm), 6.937 in. (176.2 mm), and 7.625 in. (193.7 mm)."

34. In section S7.7.5.2(a)(1)(vi) and section S7.7.5.2 (a)(2)(iii), the word "radiator" is deleted and the word "graduation" added in lieu thereof.

35. In section S7.7.5.2(b), the first two sentences are designated as paragraph (b)(1); the final sentence is designated as paragraph (b)(2); and a new paragraph (b)(3) is added to read as follows:

"(b)(3) Should the mechanism not meet the requirements of S7.7.2.1, on each motor vehicle manufactured on or after September 1, 1990, a cautionary label shall be placed adjacent to the mechanism stating the caution and including either the reason for the caution or the corrective action necessary. Each such label shall also refer the reader to the vehicle operator's manual for complete instructions. Each such vehicle shall be equipped with an operator's manual containing the complete instructions appropriate for the mechanism installed."

36. In section S7.7.5(c)(1), the words "The headlamp assembly (the headlamp(s) and the integral or separate VHAD mechanism)" are removed and the phrase "The headlamp assembly (the headlamp(s), and the VHAD(s))" is inserted in their place.

37. In section S7.7.5.2(c)(3), paragraphs (3)(iii), (3)(iv), (3)(v), (3)(vi), and (3)(vii) are redesignated as paragraphs (3)(ii)(A), (3)(ii)(B), (3)(ii)(C), (3)(ii)(D), and (3)(ii)(E), respectively.

38. The first sentence of section S8.4(b) is amended by inserting the word "in" between the words "and" and "its".

39. In section S8.7, the penultimate sentence is corrected by changing the number "20" to read "23".

40. In section S8.10, the fourth sentence is corrected by changing the number "69" to read "70".

41. In sections S10(a) and (b), the date in the reference to Standard J1383 "APR83" is corrected to read "APR85".

Issued on February 2, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 4424
February 8, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment
(Docket No. 89-10; Notice 2)
RIN 2127-AC59

ACTION: Final rule.

SUMMARY: This rule adopts a new type of standardized replaceable light source to be used in replaceable bulb headlamp systems on motor vehicles. Following the nomenclature presently used, the light source, which has a trade designation as 9007, will be known as "HB5". The new source employs a base similar to that of the HB1, but is not interchangeable with it. Like the HB1, it has two filaments. The filaments, however, are positioned axially, rather than transversely as with the HB1. This can permit use of a reflector with a lesser vertical height, resulting in a headlamp of lower profile, allowing lower front ends with the potential to improve fuel economy through reduction of aerodynamic drag. Headlamps with HB5 light sources will be designed to provide the photometrics presently specified in Standard No. 108.

This notice completes action upon a petition for rulemaking by Ford Motor Co.

EFFECTIVE DATE: May 9, 1990.

SUPPLEMENTARY INFORMATION: On June 2, 1983, NHTSA amended Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* to allow, for the first time, the use of a replaceable bulb headlamp system (48 FR 24690). This action completed rulemaking on a petition submitted by Ford Motor Company. Subsequently, the light source was designated "HB1", to distinguish it from additional light sources that were incorporated into the standard (50 FR 19961). HB1 contains both an upper and lower beam filament, and thus far has been used in headlamp systems comprised of two lamps.

Subsequently, Ford petitioned NHTSA for rulemaking to amend Standard No. 108 to permit use of another dual filament light source. NHTSA granted the Ford petition, and, on June 29, 1989, proposed the adoption of the light source that would be known as "HB5" (54 FR 27399).

The petitioner ascribed the following benefits to HB5. The two filaments are oriented axially (rather than transversely as in the HB1) for more efficient light distribution. Ford said that it achieves greater efficiency by reason of the axial filament position, thereby improving the optical relationship between the filaments and the reflector. With a typical parabolic reflector, the HB5, because of its axial filament configuration, permits more effective use of the reflector area and allows the design of headlamps with smaller vertical dimensions than are practicable with the HB1 bulb. Installation of lower profile lamps, in turn, encourages the design of lower front ends with reduction in aerodynamic drag, which has the potential of improving fuel economy.

Ford also explained that the design of the base, although similar to that of the HB1, differs sufficiently that HB1 and HB5 could not be interchanged in a given headlamp body. Other features of the HB5 are that the lower beam filament is designed to operate at a maximum of 60 watts, and the upper beam filament at a maximum of 70 watts. A headlamp with the HB5, either alone or with the HB1, would be designed to conform to the photometric specifications of SAE Standard J579 DEC84 *Sealed Beam Headlamp Units for Motor Vehicles,* presently incorporated in Standard No. 108, or, if used in combination with other types of light sources, the photometric specifications of Figure 15 or Figure 17.

As with some other standardized replaceable light sources, the HB5 is designed to use a seal on the capsule, as suggested by Ford, to assure proper centering of the filament in order to meet the photometric requirements, and to protect the interior of the lamp housing from the environment.

Comments on the proposal were received from Ford Motor Company, General Electric (GE), General Motors Corporation (GM), Chrysler Motors, Koito Manufacturing Co., Ltd., and Stanley Electric Co., Ltd. All commenters supported the proposal. Several suggested minor changes, which NHTSA has made in the final rule.

The first change concerns the 12 percent tolerance specified by section S7.6(e) on both the upper and lower beams. Ford and GE requested that the toler-

ance be increased to 15 percent, the amount specified for the HB1 light source, which will compensate for misapplication of the black cap on the front of the glass capsule. The luminous flux value was also addressed by Koito, which recommended reducing the lower beam filament from 1,000 lumens to 850 lumens, retaining the present 12 percent tolerance. Koito argued that this would increase bulb life from an estimated 320 hours to 800 hours. In rebuttal, Ford commented that this would negate the advantage provided by the bulb because it would require a larger headlamp body to produce the required headlamp beam pattern. The agency has decided, therefore, not to adopt Koito's suggestion, but to amend S7.6(e) consistent with Ford and GE's suggestion.

Several comments were received regarding the specifications of the bulb drawings (Figures 24 and 25). The drawings have been modified in minor respects to reflect these comments. However, in one instance, they have not been changed. Stanley favors a filament tolerance box for the HB5. Ford pointed out that it recommends using dimensions with tolerances on upper and lower beam filament locations because it provides all information necessary to construct the regular shaped boxes. Further, the HB1 light source does not have a filament tolerance box. Therefore, NHTSA has not adopted Stanley's suggestion.

Stanley also recommended a change to the dimensions "AD" and "AF" in Figure 24-2, in order to provide a greater distance between the filaments so that they will not touch each other. This originally occurred on the HB1 when filaments sagged and touched each other, or arced between each other when activated. Appropriate changes were made in the dimensions. When asked about Stanley's comment, Ford replied that the probability of filament contact on the HB5 with the present dimensions is lessened because the filaments lie in different vertical and horizontal planes. Also, vehicle loadings are vertical in direction, and the filaments are unlikely to come together in the diagonal plane through them. NHTSA accepts this explanation, and declines to make the change suggested by Stanley.

A change in the "AO" dimension on the locking tab for the wiring harness connector was also requested by Stanley to allow curved surfaces in the "AO" area. Ford also requested a change in Figure 24-6 or Figure 24-7 to state that such a radius may be used. Although the agency does not believe that the figures prohibit curved surfaces even though no radius is specified, it is nevertheless modifying the drawings to allow the radius.

Several comments by Ford manifested a misunderstanding of the proposal. It believed that proposed S7.5(e)(3) would not cover bulb combinations covered by the existing section. However, S7.5(e)(3) clearly states that the section applies to a headlamp system "consisting of four lamps, using any type light source except a Type HB1 or a Type HB5. . . ." Thus, the combinations that concern Ford are covered by S7.5.(e)(3), and no change is required. When two Type HB1s, two Type HB5s, or one HB1 and one HB5, are used together, only the photometrics of SAE J579 DEC84 can be used. Otherwise, the system must meet the photometric specifications of Figure 15 or Figure 17. Since there are now five different types of standardized replaceable light sources, and an apparent continuing uncertainty about the photometrics appropriate for combinations of light sources, NHTSA is adding a Figure 26 to the standard, referenced in section S7.5(b), which depicts the photometrics that combinations must meet, as a clarification of the text of the standard.

Ford's comments also assume incorrectly that Type HB2 light sources must meet SAE J579. These light sources must meet the photometrics of Figure 15 or Figure 17. Section S7.5 has been clarified to eliminate the possibility of misinterpretation.

Ford's petition and drawings depicted HB5 with a black cap, and included HB5 with other replaceable light sources to be tested with the black cap installed, but HB5 was inadvertently omitted from section S7.6(g). This section is now amended to include HB5.

The agency agrees with the comments on typographical errors, many of which have been corrected by the time of this final rule.

In consideration of the foregoing, 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

1. Section S7.5 is revised to read as follows:

S7.5 *Replaceable Bulb Headlamp System.* Each replaceable bulb headlamp system shall be designed to conform to the following requirements:

(a) The system shall provide only two lower beams and two upper beams and shall incorporate not more than two standardized replaceable light sources in each headlamp.

(b) The photometrics as specified in paragraphs (c) through (e) of this section (depicted in Figure 26), using any standardized light source of the Type intended for use in such system.

(c) The test requirements of section 4.1, 4.1.4, and performance requirements of section 5.1.4 of SAE J1383 APR85, using the photometric requirements specified in paragraphs (d) and (e) of this section. The term "aiming plane" means "aiming reference plane," or an appropriate vertical plane defined by the manufacturer as required in section S7.7.1. A 1/4 degree re-aim tolerance is permitted for any test

point. The test points 10U–90U shall be measured from the normally exposed surface of the lens face.

(d) For a headlamp system equipped with dual filament light sources, Type HB1 light sources, Type HB2 light sources, Type HB5 light sources, or Types HB1 and HB5 in combination, the following requirements apply:

(1) Headlamps designed to conform to the external aiming requirements of S7.7.5.1 shall have no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector.

(2) The lower and upper beams of a headlamp system consisting of two lamps, each containing either one or two light sources, shall be provided as follows:

(i) The lower beam shall be provided in one of the following ways:

(A) By the outboard light source (or upper one if arranged vertically) designed to conform to:

(*1*) the lower beam requirements of Table 1 of SAE Standard J579 DEC84, if the light sources in the headlamp system are only Type HB1 or Type HB5, or a combination thereof; or

(*2*) the lower beam requirements of Figure 17, if the light sources are Type HB2; or

(B) By both light sources in the headlamp, designed to conform to the lower beam requirements specified above for their type.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to:

(*1*) the upper beam requirements of Table 1 of SAE Standard J579 DEC84, if the light sources in the headlamp system are only Type HB1 or Type HB5, or a combination thereof; or

(*2*) the upper beam requirements of Figure 17, if the light sources are Type HB2; or

(B) By both light sources in the headlamp, designed to conform to the upper beam photometrics specified for their type.

(3) The lower and upper beams of a headlamp system consisting of four lamps, each containing a single light source, shall be provided as follows:

(i) The lower beam shall be provided by the outboard lamp (or the upper one if arranged vertically), designed to conform to:

(A) the lower beam requirements of Table 1 of SAE Standard J579 DEC84, if the light sources in the headlamp system are only Type HB1 or Type HB5, or a combination thereof; or

(B) the lower beam requirements of Figure 15, if the light sources are Type HB2. The lens of each such headlamp shall be marked with the letter "L".

(ii) The upper beam shall be provided by the inboard lamp (or the lower one if arranged vertically), designed to conform to:

(A) the upper beam requirements of Table 1 of SAE Standard J579 DEC84, if the light sources in the headlamp system are only Type HB1 or Type HB5, or a combination thereof; or

(B) the upper beam requirements of Figure 15, if the light sources are Type HB2. The lens of each such headlamp shall be marked with the letter "U."

(e) The following requirements apply to a headlamp system equipped with any combination of light sources except those specified in paragraph (d) of this section:

(1) Headlamps designed to conform to the external aim requirements of S7.7.5.1 shall have no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector.

(2) The lower and upper beams of a headlamp system consisting of two lamps, each containing two light sources (other than those specified in paragraph (d) of this section) shall be provided only as follows:

(i) The lower beam shall be provided in one of the following ways:

(A) By the outboard light source (or the uppermost if arranged vertically) designed to conform to the lower beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the lower beam requirements of Figure 17.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to the upper beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the upper beam requirements of Figure 17.

(3) The lower and upper beams of a headlamp system consisting of four lamps, using any combination of light sources except those specified in paragraph (d) of this section, each lamp containing only a single light source, shall be provided only as follows:

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "L."

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Figure 15. The lens of each such headlamp shall be marked with the letter "U."

(f) Each lens reflector unit manufactured as replacement equipment shall be designed to conform to the requirements of paragraphs (d) and (e) of this

section when any standardized replaceable light source appropriate for such unit is inserted in it.

(g) The lens of each replaceable bulb headlamp using any type light source, except HB1 used singly or dually, within a headlamp system on a motor vehicle, shall permanently display the type designation for that light source on the lens in front of each light source.

(h) The system shall be aimable in accordance with section S7.7.

(i) Each headlamp shall meet the requirements of sections S7.4(h) and (i), except that the sentence in paragraph (h) to verify sealing according to section S8.10 *Sealing* does not apply.

2. Section S7.6 is revised to read as follows:

S7.6 *Standardized Replaceable Light Sources.* Each standardized replaceable light source shall be designed to conform to the following requirements:

(a) A Type HB1 light source shall be designed to conform to the dimensions specified in Figure 3 and shall incorporate a silicone O-ring. Its maximum power on the lower beam shall be 50 watts, and on the upper beam, 70 watts. Its luminous flux in lumens shall be 700 ± 15% on the lower beam and 1,200 ± 15% on the upper beam.

(b) A type HB2 light source shall be designed to conform to the dimensions specified in Figure 23. Its maximum power on the lower beam shall be 65 watts, and on the upper beam, 72 watts. Its luminous flux in lumens shall be 910 ± 10% on the lower beam, and 1,500 ± 10% on the upper beam.

(c) A Type HB3 light source shall be designed to conform to the dimensions specified in Figure 19. Its maximum power on the upper beam shall be 70 watts. Its luminous flux in lumens shall be 1,700 ± 12% on the upper beam.

(d) A Type HB4 light source shall be designed to conform to the dimensions specified in Figure 20. Its maximum power shall be 60 watts on the lower beam, and its luminous flux in lumens on the lower beam shall be 1,000 ± 15%.

(e) A Type HB5 light source shall be designed to conform to the dimensions specified in Figure 24. Its maximum power shall be 60 watts on the lower beam, and 70 watts on the upper beam. Its luminous flux in lumens shall be 1,000 ± 15% on the lower beam, and 1,350 ± 15% on the upper beam.

(f) The filament of a light source shall be seasoned before measurement of maximum power and luminous flux.

(g) Measurement of maximum power and luminous flux shall be made with the direct current test voltage regulated within one quarter of one percent. The test voltage shall be design voltage, 12.8v. The measurement of luminous flux shall be in accordance with the Illuminating Engineering Society of North America, LM–45; *IES Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps* (April 1980), shall be made with the black cap installed on Type HB1, Type HB2, Type HB4, and Type HB5, and shall be made with the electrical conductor and light source base shrouded with an opaque white-colored cover, except for the portion normally located within the interior of the lamp housing. The measurement of luminous flux for the Types HB3 and HB4 shall be with the base covered with a white cover shown in Figures 19–1 and 20–1. The white covers are used to eliminate the likelihood of incorrect lumen measurement that will occur should the reflectance of the light source base and electrical connector be low.

(h) The capsule, lead wires and/or terminals, and seal on each Type HB1, Type HB3, Type HB4, and Type HB5 light source shall be installed in the base as shown in Figure 25 so as to provide an airtight seal. Such a seal exists when no air bubbles shall appear on the low pressure (connector) side after the light source has been immersed in water for one minute while inserted in a cylindrical aperture specified for the light source in Figure 25, and subjected to an air pressure of 70kPa (10 P.S.I.G.) on the glass capsule side.

(i) After the force deflection test conducted in accordance with S9, the permanent deflection of the glass envelope shall not exceed 0.005 in. (0.13 mm) in the direction of the applied force.

(j) A general tolerance shall apply to Figure 3 as follows: ±0.004 in. (0.10 mm) to all linear dimensions and ±1 degree 00 minutes to all angular dimensions except for referenced dimensions and unless otherwise specified.

(k) Each standardized light source manufactured on or after December 1, 1989, shall be marked with the symbol DOT and with a name or trademark in accordance with S7.2. In addition, the base of each such light source shall be marked with its HB Type designation.

3. Figure 8 is revised to add to the table: HB5 44.50 ± .25 mm (1.75 ± 0.01 in.).

4. New Figures 24, 25, and 26 are added as follows:

Issued on March 30, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 13138
April 9, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment
(Docket No. 88–17; Notice 2)
RIN 2127–AC65

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standard No. 108 to incorporate by reference (with minor exceptions) the current SAE Standards for stop lamps and turn signal lamps. The principal substantive effect of the rule is to require vehicles whose overall width is 80 inches or more to be equipped with stop lamps and rear turn signal lamps with a minimum luminous lens area of 12 square inches, which is presently required only if those lamps are spaced less than 22 inches apart. Other amendments are adopted essentially as proposed.

DATE: The overall effective date of the rule is November 1, 1990. The requirement for stop lamps and turn signal lamps with a larger minimum luminous lens area on certain vehicles is effective November 1, 1991.

SUPPLEMENTARY INFORMATION: A notice of proposed rulemaking on this subject was published September 9, 1988 (53 FR 35097). Comments were received from the Truck Safety Equipment Institute (TSEI), Grote Manufacturing Company, Peterson Manufacturing Company, Truck Lite, Hella AG., Ford Motor Company, Chrysler Motors, Volkswagen of America (VW), and Volvo of North America.

1. *Updating Certain SAE Standards Incorporated by Reference*

Federal Motor Vehicle Safety Standard No. 108 *Lamps, Reflective Devices, and Associated Equipment* incorporates by reference SAE Standard J586c *Stop Lamps,* August 1970, and SAE Standard J588e *Turn Signal Lamps,* September 1970, as the basic requirements for those items of motor vehicle lighting equipment. NHTSA's proposal granted a petition by TSEI for rulemaking to amend Standard No. 108 to substitute four updated SAE standards for the two presently incorporated. The updated standards are SAE J586 FEB84 *Stop Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width,* SAE J588 NOV84 *Turn Signal Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width,* SAE J1395 APR85 *Turn Signal Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width,* and SAE J1398 MAY85 *Stop Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width.* In its new standards, the SAE distinguishes between vehicles whose overall width is less than 80 inches (2,032 mm), and vehicles of greater width, a distinction made from the beginning by Standard No. 108 in its tables. TSEI supported its petition with the argument that the Society of Automotive Engineers had determined that it was desirable to adopt separate standards for certain devices when used on wider vehicles, which because of their size should be more conspicuous and better delineated with lighting devices than smaller vehicles. In the final rule, NHTSA has adopted the SAE revisions, with the exceptions proposed in 1988, subject to the comments discussed below.

A. *Increase in Minimum Lens Area for Wide Vehicles*

Until now, the minimum lens area for turn signal and stop lamps on vehicles 80 inches and wider has been 8 square inches, except that if the stop and turn signal lamps are mounted less than 22 inches apart, lenses with a minimum area of 12 square inches are required. The new SAE standards increase the minimum to 12 square inches regardless of the mounting location. In proposing the adoption of this requirement, NHTSA accepted the rationale of the SAE that the increase for all wider vehicles is necessary regardless of lamp spacing because they are susceptible to build up of grime, and concluded that an increase in lens area would enhance vehicle conspicuity and contribute to safety.

Five comments were received on this aspect of the proposal. Volvo believes that wide vehicles currently meet the specification. Peterson, Truck Lite, Grote, and Chrysler supported it. Chrysler, however, questioned applying the requirement to dual rear wheel pickup trucks, which are derivatives from those of lesser width, and asked that they be exempted from the requirement, or that a 3-year leadtime be af-

forded for compliance. Truck Lite read the SAE requirements as applying to each compartment of a multiple compartment lamp, and asked that the requirement apply to a multicompartment lamp *in toto*.

NHTSA notes that Chrysler's wide body pickup trucks are already equipped with identification and clearance lamps, lighting equipment not required for the pickup trucks from which they are derived. NHTSA does not believe that Chrysler has shown good cause for exempting widebody pickups from one of the requirements for wide truck lighting, while maintaining in effect the other requirements. The agency believes that widebody lighting should be consistent, and therefore has denied Chrysler's request for an exemption. Because lamps are readily available that meet the requirement, NHTSA regards Chrysler's request for 3 years in which to comply as excessive. However, it is establishing an effective date for this requirement of approximately 18 months after publication of this rule, which should afford sufficient time for compliance by the 1992 model year.

The agency has carefully reviewed Truck Lite's comment, and concurs in its interpretation that the SAE materials appear to require compliance of each compartment with the minimum lens area specification. In the older SAE materials, there are different photometric requirements depending on the number of compartments and the number of lamps in a system. Since the new standard contains only one set of photometric specifications, there appears to be no reason to require one level of performance from a lamp with a single compartment, and a multiple of that level of performance from a lamp with more than one compartment. However, in 4.1.5.2, there is a requirement that each compartment of a multicompartment lamp meet the photometric specifications. If read literally, this would mean that a lamp with one compartment would meet the minimum intensity values shown in Table 1 of the SAE standards, but that a lamp with five compartments would have to have minimum intensity values that are five times those for the single compartment lamp. The agency does not believe that this is the effect that the SAE hoped to achieve with these revisions. There is no discussion of why this reference to individual compartments is retained, even though the photometric specifications have been changed. This inclusion of reference to individual compartments seems to be an inappropriate provision. A similar situation exists for the area of the lamp and compartments. Paragraph 5.3.2 specifies that each compartment of a multicompartment lamp must be at least 12 square inches. There appears to be no basis for this. Therefore, the agency is adopting appropriate amendments.

Truck Lite also expressed concern that auxiliary stop and turn signal lamps would be required, under the amendments, to meet the same minimum lens area requirements as equipment installed in compliance with the standard. NHTSA does not interpret the new SAE materials as having this effect. The auxiliary lamps are subject only to the general requirement for supplementary lamps that they not impair the effectiveness of lighting equipment required by Standard No. 108.

B. *Maintenance of Minimum Lens Area for Narrower Vehicles*

The new SAE standards reduce the minimum lens area for rear turn signal lamps and stop lamps on vehicles whose overall width is less than 80 inches from 8 square inches to 6 square inches. NHTSA did not concur, and, in the interest of safety, proposed an exception that retains the current minimum of 8 square inches.

The proposal to retain the existing requirement of a minimum of 8 square inches was supported by TSEI, Grote, Peterson, and Truck Lite, and opposed by VW and Ford. Those who supported the proposal did so on the basis that there is no need to change a requirement presently in effect and being met. Further, the masking effects of road grime, dirt, and winter slush will be greater on lamps with smaller lens areas. Finally, smaller lenses may be subject to a greater likelihood of distortion caused by internally generated heat.

Those who opposed the proposal commented that a reduction of 2 square inches is supported by recent research, while NHTSA's current requirement is unsupported. More specifically, commenters pointed to recent studies, including a report, UMTRI–86–28 "Evaluation of Brake-lamp Photometric Requirements". In this report, a test is described that used lamps with lenses of 12 and 24 square inches. UMTRI found that at a distance of 50 feet, the average or equivalent luminance of the lamp was a better predictor of reaction time than was luminous intensity. However, at a longer distance (145 feet), luminous intensity was the best predictor. Based on these findings, UMTRI concluded that the use of luminous intensity as the photometric parameter for stop lamps was appropriate. This experiment was conducted under simulated daytime conditions, and did not address the question of glare and its relationship to either luminous intensity or luminance. Although the experiment did not include lamps with lenses of either 6 or 8 square inches, the results seem to support the position that area is not as important as intensity.

SAE has also run several tests which have addressed this question. Ford has cited these tests and certain findings as a primary basis for the recommendation to reduce the minimum lens area from 8 to 6 square inches, e.g., that observers found "acceptable" a 6-square inch area, and that the difference in attention-getting quality between the two lamps was not statistically significant. NHTSA observes that the SAE tests do seem to support the UMTRI conclusion that intensity should be the primary parameter for stop lamp photometrics. With respect to specific tests, the agency notes that in the SAE study of October 15, 1980, examining effectiveness of yellow and red signals under both daytime and nighttime conditions, at 50 and 500 feet, lamps with lenses of 8 square inches were judged more acceptable than those with 6. In the test of September 10, 1981, there was a slight tendency to mistake a stop lamp for a tail lamp when lamps of 80 cd and lenses of 4 square inches were used. In the daytime tests run at Ottawa on October 5, 1982, a lamp with a lens of 8 square inches was judged slightly more attention getting than one with 20 square inches (no lenses of 6 square inches were used in these tests).

Ford also provided a review of contrast in light of the work done by Blackwell. The analysis provided by Ford suggests that the contrast of a target of either 6 or 8 square inches would exceed the threshold value of contrast for the example that it chose. This analysis appears consistent with the SAE test results. These tests and the Ford analysis suggest that there is little difference in conspicuity between lamps with lenses of either 6 or 8 square inches.

A related question is whether a lamp with a lens area of 6 square inches would produce excessive glare when compared to the glare from a lamp with a lens area of 8 square inches and of the same candela. Currently there is no basis for answering this question.

One of the requirements for the center high-mounted stop lamp is that it have a lens area not less than 4.5 square inches. Many lamps are close to this minimum, and when the lamp first appeared, the agency had some complaints about glare. However, none of the complaints included details of area and intensity. The complaints, though anecdotal in nature, could indicate that small stop lamps may produce glare that reaches the level of discomfort.

On balance, the agency did not find a dispositive basis either for or against adoption of the proposal to retain lenses at their present minimum size. Therefore, NHTSA believes there is justification in retaining the present minimum area requirements rather than proceeding to a smaller lens that may raise questions of glare creation and other concerns.

C. *The Turn Signal—Headlamp Intensity Multiplier*

An additional difference between the new SAE turn signal specifications and the ones currently contained in Standard No. 108 concerns intensity. If a turn signal lamp is closer than 4 inches (100 mm) to a lower beam headlamp, it must have 2.5 times the intensity otherwise required. The SAE applies the factor of 2.5 only if the turn signal is closer than 60 mm to the lower beam headlamp. NHTSA proposed retention of the current requirement. The SAE specification applies the photometric multiplier in three steps, from 60 mm to 100 mm. VW stated that the failure of NHTSA to adopt the SAE requirement was design restrictive and not in the interests of harmonization. Ford also supported the graduated turn signal intensity multiplier, as did Hella. Peterson, Grote, and TSEI supported retention of the existing requirement.

Ford based its argument on SAE Information Report J1221 DEC84 *Headlamp-Turn Signal Spacing* which documents the change in the SAE specifications. NHTSA notes that the research in the report was performed in 1977, which was before higher intensity headlamps which comply with SAE J579c were in common use. As these headlamps are now in almost universal use in the United States, NHTSA regards the earlier research as not truly relevant today. Given the advent and usage of higher intensity headlamps, there appears to be an even greater need than before to preserve the intensity ratio. NHTSA has done so by retaining the existing requirement.

D. *The Vibration Test*

A further difference between old and new SAE standards concerns the vibration test equipment; the new SAE standards reference SAE J575 JUL83 which specifies a test environment and a "shaker type" vibration machine that differs from those specified in SAE Standard J575, July 1970, currently applicable in Standard No. 108 to vibration tests for turn signal lamps, stop lamps, and other types of lighting equipment. The agency saw no safety purpose served by introduction of a different vibration test requiring different test protocols for turn signal lamps and stop lamps, depending upon whether they were manufactured as original or replacement equipment. It proposed to retain the 1970 vibration test requirements for equipment covered by the new SAE standards.

The proposal was supported by Truck Lite, Grote, TSEI, and Peterson, principally on the basis that current lamps were specifically built to withstand this test, and that it has proven its worth over the years. Ford opposed the test as too severe; in its view,

the new SAE test is more representative of real world conditions.

NHTSA notes that work has begun within the SAE and other industry organizations to develop a new vibration requirement, reflecting the fact that the 1983 test is not universally accepted. When the SAE has developed this test, NHTSA will review it. Until such time, the agency will retain the existing 1970 test.

E. *Zonal Photometric Measurement*

The new SAE standards provide that photometric compliance is determined through sums of test points within a group, instead of doing so at individual test points. Because this is an option currently permitted by Standard No. 108, an amendment of the standard to adopt the SAE updates will result in the option becoming the mandatory requirement. Truck Lite, Peterson, Grote, and TSEI supported the effect of the proposal to make mandatory the previous option of measuring photometrics according to groups of test points. The SAE standards also contain a restriction, not previously in Standard No. 108, that the value measured at any test point be at least 60% of the required minimum for that test point. This would ensure that the performance of the lamp does not depart too much from the intent of its designer. No comments were received on this point. Adoption of the updated standards requires amendment of S5.1.1.11, with respect to motorcycle turn signal lamps, to substitute reference to the new SAE requirements for Figure 1b. This notice makes that amendment.

2. *Definitions*

NHTSA proposed that definitions be adopted for the terms "Functional Lighted Area", "Multiple Compartment Lamp", and "Multiple Lamp Arrangement". The new SAE standards use the term "functional lighted area" instead of "effective projected luminous lens area" presently used in Standard No. 108. NHTSA sought comment with supporting data or arguments on whether it was more desirable to require compliance with the "projected area", or with the actual lens area as in the new SAE standards. The notice asked whether the new language eliminated or reduced problems of interpretation associated with such phrases as "barely lighted perimeter area" and "beads and rims". Conversely, NHTSA asked whether it would be more appropriate to use a proposed ECE definition of "illuminating surface" (TRANS/SC1/WP29/R.388, Proposed Revision of Regulation No. 48).

There were no comments regarding the proposed definitions of "Multiple Compartment Lamp" and "Multiple Lamp Arrangement", other than by Peterson, which supported them. They have been adopted as proposed. With respect to "Functional Lighted Area", Grote prefers this term instead of either "effective projected luminous lens area" or the ECE definition of illuminating surface. However, Truck Lite favors "effective projected luminous lens area". Ford suggested using a definition appropriate for "effective projected luminous lens area" that NHTSA had used in past interpretations, and Peterson suggested a new definition for that term which would be similar to that provided in interpretations.

NHTSA has carefully reviewed these comments. The ECE definition is the most objective of these terms, involving the measurement of light output as the means of establishing the boundary of the area. However, the size of the area that may be established using that procedure could be larger than the actual lens area. For example, the size for a circular lens, as established by the ECE procedure, may be as much as 27 percent larger than the actual lens area.

NHTSA's past interpretations have failed to indicate that the part of the lens that is the basis for the measurement is "the part of the lens optical system that directs light to the photometric test pattern" (the phrase used in the proposal). Thus, the interpretations are also unsuitable as the complete definition. Peterson commented on this failure, and addressed it by suggesting use of the term "that area of the light emitting surface."

The definition that the agency proposed in 1988 would use the actual area of the lens instead of a projection of the lighted area of the lens. None of the other definitions incorporate actual area. Vehicle operators see the projected area rather than the actual area. Also, measurement of actual area would be more difficult than measurement of projected area. Therefore, the agency has decided that the definition adopted should be for the projected area, and has adopted a modification of the definition proposed. The clarification suggested by Peterson is also incorporated. Because the SAE uses the term "Functional Lighted Lens Area", a new section S6.3 has been added to clarify that the term "Effective Projected Luminous Lens Area" is identical to it, and should be substituted wherever it appears in the SAE materials incorporated by reference and subreference in Standard No. 108.

3. *Miscellaneous*

In accordance with past practice, replacement stop lamps and turn signal lamps may continue to be designed to conform with the same versions of the SAE standards as the equipment they replace, and appropriate amendments are adopted in S5.1.1.6 and S5.1.1.7 to clarify this point. Tables I and III are amended by replacing the references to the old SAE standards for turn signal lamps and stop lamps with the new ones.

4. *Effective Dates*

The effective date of this final rule is November 1, 1990, except that the requirement that vehicles whose overall width is 80 inches or more be equipped with stop lamps and rear turn signal lamps with a minimum luminous lens area of 12 square inches is effective November 1, 1991. The agency notes that Volvo requested a lead time of 2 years, and Chrysler, an effective date of September 1, 1993. Equipment is currently available that meets the requirements, but the retooling involved in equipping vehicles with these lamps provides sufficient cause for finding that an effective date later than one year after issuance is in the public interest, and the agency has chosen one that is approximately 18 months after issuance of the final rule.

5. *Parallel Action of Office of Motor Carrier Standards*

Concurrently with the publication of this rule, the Office of Motor Carrier Standards, Federal Highway Administration, is proposing adoption of the updated SAE standards in the Federal Motor Carrier Safety Regulations, 49 CFR Part 393, for commercial motor vehicles operating in interstate commerce (55 FR [to be completed by the *Federal Register*]).

In consideration of the foregoing, 49 CFR Part 571 and Sec. 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

1. S4 *Definitions* is amended by adding the following definitions in alphabetical order:

"Effective projected luminous lens area" means that area of the projection on a plane perpendicular to the lamp axis of that portion of the light-emitting surface that directs light to the photometric test pattern, and does not include mounting hole bosses, reflex reflector area, beads or rims that may glow or produce small areas of increased intensity as a result of uncontrolled light from small areas (½ deg. radius around the test point).

"Multiple compartment lamp" means a device which gives its indication by two or more separately lighted areas which are joined by one or more common parts, such as a housing or lens.

"Multiple lamp arrangement" means an array of two or mor separate lamps on each side of the vehicle which operate together to give a signal.

2. S5.1.1.6 is revised by designating the text as paragraph (a), and by adding new paragraphs (b) and (c) to read:

"(b) Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970, may also be designed to conform to J586c.

"(c) A multipurpose passenger vehicle, truck, bus, or trailer whose overall width is 80 inches or more, manufactured on or before November 30, 1991, and whose stop lamps are located more than 22 inches apart, may be equipped with stop lamps designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970."

3. S5.1.1.7 is revised by designating the text as paragraph (a), and by adding new paragraphs (b) and (c) to read:

"(b) Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588e, *Turn Signal Lamps,* September 1970, may also be designed to conform to SAE Standard J588e. Note 6 of Table 1 of SAE Standard J588e does not apply. A stop lamp that is not optically combined with a turn signal lamp shall remain activated when the turn signal is flashing.

(c) A multipurpose passenger vehicle, truck, bus, or trailer, whose overall width is 80 inches or greater, manufactured on or before October 31, 1991, and whose turn signal lamps are located more than 22 inches apart, may be equipped with turn signal lamps designed to conform to SAE Standard J588e, *Turn Signal Lamps,* September 1970.

4. The first sentence of S5.1.1.11 is revised to read:

S5.1.1.11 A parking lamp, tail lamp, stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970, or turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588e, *Turn Signal Lamps,* September 1970, shall meet the minimum percentage specified in Figure 1a of the corresponding minimum allowable value specified in Figure 1b.

5. In the last sentence of S5.1.1.11 the words "Figure 1b" are removed, and "Table 1 and Table 3 of SAE J588 NOV84 *Turn Signal Lamps*" are inserted in their place.

6. S5.1.1.12 is revised to read:

S5.1.1.12 A parking lamp, tail lamp, stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586c *Stop Lamps,* August 1970, or turn signal lamp manufactured to replace a turn signal lamp manufactured to conform to SAE Standard J588e, *Turn Signal Lamps,* September 1970, is not required to meet the minimum photometric value at each test point specified in this standard if the sum of the percentages of the minimum candlepower measured at the test points is not less than that specified for each group listed in Figure 1c.

7. New sections S5.1.1.30 and S5.1.1.31 are added to read:

S5.1.1.30 On a motor vehicle whose overall width is less than 80 inches:

(a) The functional lighted lens area of a single compartment stop lamp, and a single compartment

rear turn signal lamp, shall be not less than 50 square centimeters.

(b) If a multiple compartment lamp or multiple lamps are used to meet the photometric requirements for stop lamps and rear turn signal lamps, the functional lighted lens area of each compartment or lamp shall be at least 22 square centimeters, provided the combined area is at least 50 square centimeters.

S5.1.1.31 On a motor vehicle, except a passenger car, whose overall width is 80 inches or more, measurements of the functional lighted lens area, and of the photometrics, of a multiple compartment stop lamp, and a multiple compartment turn signal lamp, shall be made for the entire lamp and not for the individual compartments.

8. S5.3.1.7 is revised to read:

S5.3.1.7 On a motor vehicle on which the front turn signal lamp is less than 100 mm from the lighted edge of a lower beam headlamp, the multiplier applied to obtain the required minimum luminous intensities shall be 2.5.

9. In S6.1, the exception clause of the first sentence is revised to read:

S6.1 . . . , except that the SAE standard referred to as "J575" is J575e, *Tests for Motor Vehicle Lighting Devices and Components,* August 1970, for stop lamps designed to conform to SAE Standards J586c, J586 FEB84, and J1398 MAY 85; for tail lamps designed to conform to SAE Standards J585d and J585e; for turn signal lamps designed to conform to SAE Standards J588e, J588 NOV84, and J1395 APR85; and for high-mounted stop lamps designed to conform to SAE Recommended Practice J186a.

10. New section S6.3 is added to read:

S6.3 The term "effective projected luminous lens area" has the same meaning as the term "functional lighted lens area" in any SAE Standard or Recommended Practice incorporated by reference or by subreference in this standard.

11. In Table I, the applicable SAE standard (final column) for stop lamps is revised to read "SAE J1398 MAY85," and for turn signal lamps "SAE J1395 APR85."

12. In Table III, the applicable SAE standard (final column) for stop lamps is revised to read "SAE J586 FEB84," and for turn signal lamps "SAE J588 NOV84."

13. In Tables I and III, in the first column, the number "2" referencing footnote 2 is removed from "Stop lamps" and "Turn signal lamps."

Issued on May 10, 1990.

Jerry Ralph Curry
Administrator

55 FR 20158
May 15, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment
(Docket 89-24; Notice 2)
RIN 2127-AC77

SUMMARY: This rule deletes the prohibition against optical combinations of clearance lamps and identification lamps. The purpose of this action is to eliminate a requirement deemed no longer necessary for safety.

This notice responds to a petition by the Truck Safety Equipment Institute (TSEI), and adopts a proposal published in December 1989.

DATES: The rule is effective December 6, 1990.

SUPPLEMENTARY INFORMATION: This notice completes rulemaking on one of the proposals published on December 5, 1989, which had as its purpose the deletion of all references to "optical combinations" of lamps (54 FR 50254). Because comments did not support other aspects of the proposal, NHTSA will issue a supplementary notice proposing adoption of the definition of the Society of Automotive Engineers.

From its very beginning, Motor Vehicle Safety Standard No 108, in one version or another, has allowed two or more lamps, reflective devices, or items of associated equipment to be combined, if the requirements for each are met, provided that certain specified lamps were not "optically combined" (*See, e.g.*, sections S3.3, S3.4.4.3, 23 CFR Sec. 255.21 revised as of January 1, 1968, Motor Vehicle Safety Standard No. 108). The current provisions addressed by this rule are contained in section S5.4.1.

Specifically, section S5.4.1 permits lighting equipment to be "combined", provided that "no clearance lamp may be combined optically with any taillamp or identification lamp, and no high mounted stop lamp shall be combined with any other lamp or reflective device." The agency has never adopted a definition of "optically combined", but has over the years attempted to clarify the term by issuing a variety of interpretations.

On June 14, 1988, the Truck Safety Equipment Institute ("TSEI") petitioned the agency for rulemaking to amend Standard No. 108 to adopt the Society of Automotive Engineers' (SAE) definition of the term "combined optically" as set forth in SAE Information Report J387 OCT88 "Terminology—Motor Vehicle Lighting." Until the revision of SAE J387 in 1988, the term had been undefined, though appearing in the two SAE standards for many years, as well as Standard No. 108. TSEI had examined the opinion letters issued by NHTSA and concluded that they were inconsistent, alleging, for example, that one had "apparently been used to justify designs which have the clearance lamp bulb mounted in close proximity to the dual filament stop/tail lamp bulb . . . . Both use a common lens area for the output of the tail and clearance functions. It does not appear that this is in keeping with either the spirit or the intent of FMVSS 108." The petitioner also mentioned that Canada had adopted, effective September 2, 1987, a definition of "combined optically" which is substantially similar to that of the SAE.

In considering TSEI's petition, NHTSA examined the existing prohibitions against lamp combinations. The agency tentatively concluded that it is no longer necessary to forbid the "optical combination" of clearance lamps and identification lamps. The locational requirements of Standard No. 108 with respect to each are so dissimilar that they could not be met with an "optically combined" lamp. Under Table II of Standard No. 108, the three lamp cluster of identification lamps are to be mounted within a narrow space around the vertical centerline on vehicles whose overall width is 80 inches or more, while clearance lamps must be mounted to indicate the overall width of that vehicle. Further, under paragraph S5.3.1.4, when the rear identification lamps are mounted at the extreme height of the vehicle, the rear clearance lamps need not be located as close as practicable to the top of the vehicle. In the judgment of the agency, the likelihood of "optical combination" of identification and clearance lamps was infinitesimal.

Accordingly, the agency proposed a revision of the requirement under which lighting equipment could be "combined if the requirements for each . . . . are met, except that a taillamp shall not share a light source, lens, or lamp body with a clearance lamp, and a center highmounted stop lamp shall not share a light source, lens, or lamp body with any other lamp or reflective device."

Comments were received from White/GMC Trucks, Chrysler Corporation, General Motors Corporation, Truck Safety Equipment Institute (TSEI), Peterson Manufacturing Company, Grote Manufacturing Company, Ford Motor Company, Truck-Lite Company, and Dry Launch. Commenters supported the deletion of the prohibition against optical combination of clearance lamps and identification lamps, for the reasons given by NHTSA in its proposal. However, all commenters other than Chrysler specifically objected to the terminology used by NHTSA to substitute clarifying language for "optical combination." In their views, adoption of the proposed language would prohibit use of currently-permissible lamps that share a lamp body. Each of the commenters who objected urged NHTSA to consider adoption of the SAE definition, as TSEI had originally requested.

The agency also considered the prohibition against optically combining other lamps. Similarly, the commenters objected to these proposals, and recommended adoption of the SAE definition. NHTSA will address these comments in a supplemental notice of proposed rulemaking, Notice 3.

Because the rule will remove an existing restriction, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest. Accordingly, the amendment is effective 30 days after its publication in the *Federal Register*.

In consideration of the foregoing, 49 CFR Part 571.108 Motor Vehicle Safety Standard No. 108 *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

PART 571 (AMENDED)

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1407; delegations of authority at 49 CFR 1.50.

§ 571.108 [Amended]

2. S5.4. of Standard No. 108 is revised to read as follows:

S5.4 *Equipment combinations*. Two or more lamps, reflective devices, or items of associated equipment may be combined if the requirements for each lamp, reflective device, and item of associated equipment are met, except that no clearance lamp may be optically combined with any taillamp, and no high-mounted stop lamp shall be combined with any other lamp or reflective device.

3. S5.4.1 of Standard No. 108 is removed.

Issued on: October 31, 1990.

Jeffrey R. Miller
Deputy Administrator

55 F.R. 46669
November 6, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket 88-17; Notice 3)
RIN 2127-AC65

ACTION: Final Rule.

SUMMARY: This notice responds to petitions for reconsideration of amendments to Federal Motor Vehicle Safety Standard No. 108 published in May 1990 that incorporated by reference (with minor exceptions) the current SAE Standards for stoplamps and turn signal lamps. The agency denies a petition to remove the exclusions from the definition of "effective projected luminous lens area." However, in recognition that this may create an immediate compliance problem, the agency is delaying the effective date of all amendments from December 1, 1990, to December 1, 1991.

EFFECTIVE DATES: The effective date of the rule is December 1, 1991.

SUPPLEMENTARY INFORMATION: A final rule was published May 15, 1990 (55 FR 20158) adopting updated SAE standards for stop lamps and turn signal lamps. The updated standards are SAE J586 FEB84 *Stop Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width,* SAE J588 NOV84 *Turn Signal Lamps for Use on Motor Vehicles Less Than 2032 mm in Overall Width*, SAE J1395 APR85 *Turn Signal Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width*, and SAE J1398 MAY85 *Stop Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width.* Petitions for reconsideration of the rule were received from Ford Motor Company and General Motors Corporation. Subsequently, comments were received from Peterson Manufacturing Company, which this notice will also address. The comments concerned the intensity multiplier, definition of "effective projected luminous lens area," and miscellaneous items.

1. Issue of The Turn Signal—Headlamp Intensity Multiplier

In the final rule, paragraph S5.3.1.7 was adopted to clarify that if a turn signal lamp is closer than 4 inches (100 mm) to a lower beam headlamp, it must have 2.5 times the intensity otherwise required. The purpose of the requirement was to distinguish it from the SAE specification, which applies the factor of 2.5 only if the turn signal is closer than 60 mm to the lower beam headlamp. In the previous SAE specification incorporated by reference in Standard No. 108, measurement was taken from the optical center of the turn signal lamp. The updated SAE specification requires it to be taken from the centroid of the lens. This has presented a problem to Ford, which stated that several 1991 and later model year vehicles cannot meet the requirements of the final rule without substantial redesign, if measurement is to be taken from the centroid. Ford pointed out that the new SAE requirement is intended to be used in combination with graduated turn signal intensity multipliers, which NHTSA did not adopt. Peterson, Grote, and TSEI supported retention of the existing requirement.

Ford based its argument on SAE Information Report J1221 DEC84 *Headlamp-Turn Signal Spacing* which documents the change in the SAE specifications. NHTSA notes that the research in the Report was performed in 1977, which was before higher intensity headlamps which comply with SAE J579c were in common use. As these headlamps are now in almost universal use in the United States, NHTSA regards the earlier research as not truly relevant today. Given the advent and usage of higher intensity headlamps, there appears to be an even greater need than before to preserve the intensity ratio. NHTSA has done so by retaining the previously existing requirement of measurement from the optical center of the lens. The petition for reconsideration is granted, and an appropriate revision is made in S5.3.1.7.

2. Issue of Definitions

NHTSA adopted a definition for the term "effective projected luminous lens area" which specifically excluded "mounting hole bosses, reflex reflector area, beads or rims that may glow or produce small areas of increased intensity as a result of uncontrolled light from small areas (½ deg. radius around the test point)." In its petition for reconsideration, GM called to the agency's attention a 20-year-old interpretation provided American Motors Corporation stating that "molded optical rings or markings shall be considered part of the total . . . . even if they do not contribute

significantly to the total light output." GM went on to say that it has depended on this interpretation as the basis for calculating lens area. In particular, GM has included the rim (or leg) of lenses in the calculation of lens area in those instances where the rim transmits unobstructed light. GM argues that it is disadvantaged by the new definition because at least one of its current production models requires inclusion of the lens rim area to meet the minimum lens area as now defined by Standard No. 108. It asked that NHTSA adopt the SAE definition. This same request was made by Ford, also concerned by the differences between the NHTSA definition, and SAE's.

NHTSA has carefully reviewed these comments. The definition in SAE J387 OCT88 includes lens parts, "even if they do not contribute significantly to the total light output." The agency has concluded that areas that do not contribute significantly to light output should not be included in determinations of minimum lens area because they do not add to the "effectiveness" of the lamp. To be fully effective, the lamp must project light in an appropriate manner. The optical parts of the reflector and lens are designed to achieve that purpose. Mounting bosses, screw holes, lens rims or legs do not contribute to the optical design. They take up surface area that can reduce the area of the optically designed part of the lens if they are allowed to be included in the computation of minimum lens area. After due consideration, the agency denies the petitions for adoption of the SAE definition.

3. Issue of Terminology

Paragraphs S5.1.1.11 and S5.1.1.12 establish requirements for lamps that are "manufactured to replace" equivalent lamps "designed to conform" to specified SAE requirements. Ford commented that the use of the word "manufactured" appeared to be in error, and that the word should have been "designed", in keeping with the standard's general requirement that equipment be "designed to conform", rather than "conform." Choice of the word "manufactured" was deliberate, and not an error. The agency wished to avoid the use of the word "designed" twice in a single sentence, and found awkward the phrase "lamps designed to replace lamps designed to conform" to the SAE requirements. Such a phrase would not of itself require design compliance of replacement lamps with the SAE requirements. Neither section requires that the replacement lamps meet the SAE requirements that their original equipment counterparts are designed to meet (in which case the "design" language would be appropriate). Further, each provides an exception from those requirements if the lamps meet the specific requirements of Figure 1 of Standard No. 108. No petitioner argued that the lamps should be "designed to meet" Figure 1 which in this context appears the more appropriate argument.

However, in one instance Ford is correct. The phrase "manufactured to conform to SAE Standard J588e" appears in S5.1.1.12. NHTSA is amending that section to substitute "designed" for "manufactured".

4. Issue of Effective Date

The effective date of the final rule published on May 15, 1990 is December 1, 1990, except that the requirement that vehicles whose overall width is 80 inches or more be equipped with stoplamps and rear turn signal lamps with a minimum luminous lens area of 12 square inches is effective December 1, 1991. The retooling involved in equipping vehicles with the new lamps provided sufficient cause for finding that an effective date later than one year after issuance was in the public interest.

As noted previously, NHTSA's actions in this rulemaking appear to have presented compliance problems for GM. The company has stated that NHTSA's definition of "effective projected luminous lens area" has created a compliance problem for it. This problem remains because NHTSA has denied GM's petition to adopt the SAE definition of the term. In recognition of GM's problems, NHTSA has decided to delay the effective date for the amendments published on May 15, 1990, to December 1, 1991.

Therefore, the effective date for the amendments to 49 CFR 571.108 Motor Vehicle Safety Standard No. 108 *Lamps, Reflective Devices, and Associated Equipment* published on May 15, 1990 (55 FR 20158) is hereby changed from December 1, 1990, to December 1, 1991.

The final rule contained an erroneous effective date in paragraph S5.1.1.7(c), and an appropriate amendment is made.

Pursuant to 5 U.S.C. 553(d)(1), this notice is effective on December 1, 1990, a period less than 30 days after its issuance, because it is a substantive rule that relieves a restriction.

5. Miscellaneous Issue

Peterson brought to the agency's attention the possibility that confusion could be caused by the statement in the summary information in the final rule that rear turn signal lamps require a minimum luminous lens area of 12 square inches, implying that there is a different requirement for the front turn signal lamps.

There is no different requirement for front turn signal lamps. The newly incorporated SAE documents make clear that the minimum luminous lens area requirements apply to all turn signal lamps. The thrust of the agency's rulemaking was toward rear lamps, and it regrets any confusion that may have been caused by not mentioning the front lamps.

In consideration of the foregoing, 49 CFR Part 571 and Sec. 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, are amended as follow:

1. The authority citation for Part 571 continues to read:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

2. In S5.1.1.7(c), the date "October 31, 1991" is changed to "November 30, 1991."

3. In S5.1.1.12, the phrase "manufactured to conform to SAE Standard J588e" is revised to read "designed to conform to SAE Standard J588e."

4. S5.3.1.7 is revised to read:

S5.3.1.7 On a motor vehicle on which the front turn signal lamp is less than 100 mm from the lighted edge of a lower beam headlamp, as measured from the optical center of the turn signal lamp, the multiplier applied to obtain the required minimum luminous intensities shall be 2.5.

Issued on: November 28, 1990.

Jerry Ralph Curry
Administrator

55 F.R. 50182
December 5, 1990

MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, and Motorcycles

(Docket No. 69-18)

S1. Scope. This standard specifies requirements for original and replacement lamps, reflective devices, and associated equipment.

S2. Purpose. The purpose of this standard is to reduce traffic accidents and deaths and injuries resulting from traffic accidents, by providing adequate illumination of the roadway, and by enhancing the conspicuity of motor vehicles on the public roads so that their presence is perceived and their signals understood, both in daylight and in darkness or other conditions of reduced visibility.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers (except pole trailers and trailer converter dollies), and motorcycles, and to lamps, reflective devices, and associated equipment for replacement of like equipment on vehicles to which this standard applies.

S4. Definitions. "Aiming Reference Plane" means a plane which is perpendicular to the longitudinal axis of the vehicle and tangent to the forwardmost aiming pad on the headlamp.

"Beam contributor" means an indivisible optical assembly including and lens, reflector, and light source, that is part of an integral beam headlighting system and contributes only a portion of a headlamp beam.

"Direct reading indicator" means a device that is mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, is part of a VHAD, and provides information about headlamp aim in an analog or digital format.

【"Effective projected luminous lens area" means that area of the projection on a plane perpendicular to the lamp axis of the portion of the light-emitting surface that directs light to the photometric test pattern, and does not include mounting hole bosses, reflex reflector area, beads or rims that may glow or produce small areas of increased intensity as a result of uncontrolled light from small areas (½ deg. radius around the test point). **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)】**

"Flash" means a cycle of activation and deactivation of a lamp by automatic means, continuing until stopped either automatically or manually.

"Headlamp test fixture" means a device designed to support a headlamp or headlamp assembly in the test position specified in the laboratory tests and whose mounting hardware and components are those necessary to operate the headlamp as installed in a motor vehicle.

"Integral Beam Headlamp" means a headlamp comprising an integral and indivisible optical assembly including lens, reflector, and light source, that is neither a standardized sealed beam headlamp designed to conform to paragraph S7.3 nor a replaceable bulb headlamp designed to conform to paragraph S7.5.

【"Multiple compartment lamp" means a device which gives its indication by two or more separately lighted areas which are joined by one or more common parts, such as a housing or lens. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)】**

【"Multiple lamp arrangement" means an array of two or more separate lamps on each side of the vehicle which operate together to give a signal. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)】**

【"Remote reading indicator" means a device that is not mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, but otherwise meets the definition of a direct reading indicator.

"Replaceable bulb headlamp" means a headlamp comprising a bonded lens and reflector assembly and one or two standardized replaceable light sources.

"Seasoning" means a process of energizing the filament of a headlamp, at design voltage, for a period of time equal to 1 percent of average rated laboratory life.

"Standardized replaceable light source" means an assembly of a capsule, base, and terminals, that meets the requirements of S7.6.

[“Vehicle headlamp aiming device” or “VHAD” means motor vehicle equipment permanently installed on a motor vehicle by the manufacturer of the vehicle, which is used for determining the horizontal and vertical aim of headlamps.

S5. Requirements.

S5.1 Required motor vehicle lighting equipment.

S5.1.1 Except as provided in succeeding paragraphs of S5.1.1, each vehicle shall be equipped with at least the number of lamps, reflective devices, and associated equipment specified in Tables I and III and S7, as applicable. Required equipment shall be designed to conform to the SAE Standards or Recommended Practices referenced in those tables. Table I applies to multipurpose passenger vehicles, trucks, trailers, and buses, 80 or more inches in overall width. Table III applies to passenger cars and motorcycles and to multipurpose passenger vehicles, trucks, trailers, and buses, less than 80 inches in overall width.

S5.1.1.1 A truck tractor need not be equipped with turn-signal lamps mounted on the rear if the turn signal lamps at or near the front are so constructed (double-faced) and so located that they meet the requirements for double-faced turn signals specified in SAE Standard J588e, *Turn Signal Lamps,* September 1970.

S5.1.1.2 A truck tractor need not be equipped with any rear side marker devices, rear clearance lamps, and rear identification lamps.

S5.1.1.3 Intermediate side marker devices are not required on vehicles less than 30 feet in overall length.

S5.1.1.4 Reflective material conforming to Federal Specification L–S–300, *Sheeting and Tape, Reflective; Non-exposed Lens, Adhesive Backing,* September 7, 1965, may be used for side reflex reflectors if this material, as used on the vehicle, meets the performance standards in either Table I or Table IA of SAE Standard J594f, *Reflex Reflectors,* January 1977.

S5.1.1.5 The turn signal operating unit on each passenger car and multipurpose passenger vehicle, truck, and bus less than 80 inches in overall width shall be self-canceling by steering wheel rotation and capable of cancellation by a manually operated control.

S5.1.1.6 [(a)] Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586b *Stop Lamps,* June 1966, may also be designed to conform to J586b. It shall meet the photometric minimum candlepower requirements for Class A red turn signal lamps specified in SAE Standard J575d, *Tests for Motor Vehicle Lighting Devices and Components,* August 1967. Each such lamp manufactured for use on a passenger car and on a multipurpose passenger vehicle, truck, trailer, or bus less than 80 inches in overall width shall have an effective projected luminous area not less than 3½ square inches. If multiple compartment lamps or multiple lamps are used, the effective projected luminous area of each compartment or lamp shall be not less than 3½ square inches; however, the photometric requirements may be met by a combination of compartments or lamps.

[(b) Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970, may also be designed to conform to J586c. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)**]

[(c) A multipurpose passenger vehicle, truck, bus, or trailer whose overall width is 80 inches or more, manufactured on or before November 30, 1991, and whose stop lamps are located more than 22 inches apart, may be equipped with stop lamps designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970.” **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)**]

S5.1.1.7 (a) Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588d *Turn Signal Lamps,* June 1966, may also be designed to conform to J588d, and shall meet the photometric minimum candlepower requirements for Class A turn signal lamps specified in SAE Standard J575d, *Tests for Motor Vehicle Lighting Devices and Components,* August 1967. Each such lamp manufactured for use on a passenger car and on a multipurpose passenger vehicle, truck, trailer or bus less than 80 inches in overall width shall have an effective projected luminous area not less than

3½ square inches. If multiple compartment lamps or multiple lamps are used, the effective projected luminous area of each compartment or lamp shall be not less than 3½ square inches; however, the photometric requirements may be met by a combination of compartments or lamps. Each such lamp manufactured for use on a multipurpose passenger vehicle, truck, trailer or bus 80 inches or more in overall width shall have an effective projected luminous area not less than 12 square inches.

[(b) Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588e, *Turn Signal Lamps*, September 1970, may also be designed to conform to SAE Standard J588e. Note 6 of Table 1 of SAE Standard J588e does not apply. A stop lamp that is not optically combined with a turn signal lamp shall remain activated when the turn signal is flashing. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

[(c) A multipurpose passenger vehicle, truck, bus, or trailer, whose overall width is 80 inches or greater, manufactured on or before November 30, 1991, and whose turn signal lamps are located more than 22 inches apart, may be equipped with turn signal lamps designed to conform to SAE Standard J588e, *Turn Signal Lamps*, September 1970. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

S5.1.1.8 For each motor vehicle less than 30 feet in overall length, the photometric-minimum candlepower requirements for side marker lamps specified in SAE Standard J592e, *Clearance, Side Marker, and Identification Lamps,* July 1972, may be met for all inboard test points at a distance of 15 feet from the vehicle and on a vertical plane that is perpendicular to the longitudinal axis of the vehicle and located midway between the front and rear side marker lamps.

S5.1.1.9 A boat trailer whose overall width is 80 inches or more need not be equipped with both front and rear clearance lamps provided an amber (to front) and red (to rear) clearance lamp is located at or near the midpoint on each side so as to indicate its extreme width.

S5.1.1.10 Multiple license plate lamps and backup lamps may be used to fulfill the requirements of the SAE Standards applicable to such lamps referenced in Tables I and III.

S5.1.1.11 [A parking lamp, tail lamp, stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586c, *Stop Lamps*, August 1970, or turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588e, *Turn Signal Lamps*, September 1970, shall meet the minium percentage specified in Figure 1a of the corresponding minimum allowable value specified in Table 1 and Table 3 of SAE J588 NOV84 *Turn Signal Lamps*. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

Test points (deg)		*Turn signal*	*Stop*	*Parking*	*Tail*
10U, 10D	5L, 5R	20	20	20	20
	20L, 20R	12.5	12.5	10	15
5U, 5D	10L, 10R	37.5	37.5	20	40
	V	87.5	87.5	70	90
	10L, 10R	50	50	35	40
H	5L, 5R	100	100	90	100
	V	100	100	100	100

FIGURE 1a.—Required percentages of minimum candlepower of Figure 1b.

NOTE.—Minimum design candlepower requirements are determined by multiplying the percentages given in this Figure by the minimum allowable candlepower values in Figure 1b. The resulting values shall be truncated after one digit to the right of the decimal point.

Lamp	*Lighted Sections* 1	2	3
Stop	80/300	95/360	110/420
Tail[1]	2/18	3.5/20	5.0/25
Parking[2]	4.0/125	......	......
Red turn signal	80/300	95/360	110/420
Yellow turn signal rear	130/750	150/900	175/1050
Yellow turn signal front	200/ -	240/ -	275/ -
Yellow turn signal front[3]	500/ -	600/ -	685/ -

FIGURE 1b.—Minimum and maximum allowable candlepower values.

[1] Maximum at H or above.

[2] The maximum candlepower value of 125 applies to all test points at H or above. The maximum allowable candlepower value below H is 250.

[3] Values apply when the optical axis (filament center) of the front-turn signal is at a spacing less than 4 inches (10 cm.) from the lighted edge of the headlamp unit providing the lower beam, or from the lighted edge of any additional lamp installed as original equipment and which supplements the lower beam.lower beam.

S5.1.1.12 [A parking lamp, tail lamp, stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586c *Stop Lamps*, August 1970, or turn signal lamp manufactured to replace a turn signal lamp designated to conform to the SAE Standard J588e, *Turn Signal Lamps*, September 1970, is not required to meet the minimum photometric value at each test point specified in this standard if the sum of the percentages of the minimum candlepower measured at the test points is not less than that specified for each group listed in Figure 1c. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

Groups and test points	*Turn signal*	*Stop*	*Parking*	*Tail*
10U–5L, 5U–20L, 5D–20L, 10D–5L	65	65	60	70
5U–10L, H–10L, 5D–10L .	125	125	75	120
H–5L, 5U–V, H–V, 5D–V, H–5R	475	475	420	480
5U–10R, H–10R, 5D–10R .	125	125	75	120
10U–5R, 5U–20R, 5D–20R, 10D–5R	65	65	60	70

FIGURE 1c.—Sum of the percentages of grouped minimum candlepower.

S5.1.1.13 Each passenger car, and each multipurpose passenger vehicle, truck, and bus of less than 80 inches overall width, shall be equipped with a turn signal operating unit designed to complete a durability test of 100,000 cycles.

S5.1.1.14 A trailer that is less than 30 inches in overall width may be equipped with only one tail lamp, stop lamp, and rear reflex reflector, which shall be located at or near its vertical centerline.

S5.1.1.15 A trailer that is less than 6 feet in overall length, including the tongue, need not be equipped with front side marker lamps and front side reflex reflectors.

S5.1.1.16 A lamp designed to use a type of bulb that has not been assigned a mean spherical candlepower rating by its manufacturer and is not listed in SAE Standard J 573d, *Lamp Bulbs and Sealed Units*, December 1986, shall meet the applicable requirements of this standard when used with any bulb of the type specified by the lamp manufacturer, operated at the bulb's design voltage. A lamp that contains a sealed-in bulb shall meet these requirements with the bulb operated at the bulb's design voltage.

S5.1.1.17 Except for a lamp having a sealed-in bulb, a lamp shall meet the applicable requirements of this standard when tested with a bulb whose filament is positioned within ±.010 inch of the nominal design position specified in SAE Standard J573d, *Lamp Bulbs and Sealed Units*, December 1968, or specified by the bulb manufacturer.

S5.1.1.18 A backup lamp is not required to meet the minimum photometric values at each test point specified in Table I of SAE Standard J593c, *Backup Lamps*, February 1968 if the sum of the candlepower measured at the test points within each group listed in Figure 2 is not less than the group totals specified in that figure.

(a) Each headlamp system, other than a headlamp system designed to conform to paragraph S7.5, that is designed to use such external aiming devices shall not deviate more than 0.30 degree when a downward torque of 20lb.-in. (2.25 N-m) is applied to the headlamp in its normal operating position, through the lamp's mechanical axis at the plane of the forwardmost aiming pad. Each headlamp system that is designed to conform to paragraph S7.5 and that is designed to use such external aiming devices, and which is manufactured on or after September 1, 1990, shall comply with this paragraph.

S5.1.1.19 Each variable load turn signal flasher shall comply with voltage drop and durability requirements of SAE Standard J590b, *Turn Signal Flasher*, October 1965 with the maximum design load connected, and shall comply with starting time, flash rate, and percent current "on" time requirements of J590b both with the minimum and with the maximum design load connected.

S5.1.1.20 The lowest voltage drop for turn signal flashers and hazard warning signal flashers measured between the input and load terminals shall not exceed 0.8 volt.

S5.1.1.21 A motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps.

S5.1.1.22 A motor-driven cycle whose speed attainable in 1 mile is 30 mph or less may be equipped with a stop lamp whose effective projected

luminous lens area is not less than 3½ square inches and whose photometric output for the groups of test points specified in Figure 1 is at least one-half of the minimum values set forth in that figure.

S5.1.1.23 Each tail lamp manufactured to replace the tail lamp designed to conform to SAE Standard J585d, *Tail Lamps*, August 1970, may also be designed to conform to J585d.

S5.1.1.24 Each turn signal lamp manufactured to replace a turn signal lamp (on a motorcycle) that was designed to conform to SAE Standard J588d, *Turn Signal Lamps*, June 1966, may also be designed to conform to J588d.

S5.1.1.25 Each turn signal lamp on a motorcycle manufactured on and after January 1, 1973, shall have an effective projected luminous area of not less than 3½ square inches.

S5.1.1.26 Note 6 of Table 1 in SAE Standard J588e, *Turn Signal Lamps*, September 1970, does not apply. A stop lamp that is not optically combined with a turn signal lamp shall remain activated when the turn signal is flashing.

S5.1.1.27 Each passenger car manufactured on or after September 1, 1985, shall be equipped with a high-mounted stop lamp which:

(a) Shall have an effective projected luminous area not less than 4½ square inches.

(b) Shall have a signal visible to the rear through a horizontal angle from 45 degrees to the left to 45 degrees to the right of the longitudinal axis of the vehicle.

(c) Shall have the minimum photometric values in the amount and location listed in Figure 10, instead of those in Table 1 of SAE Recommended Practice J186a, *Supplemental High-Mounted Stop and Rear Turn Signal Lamps*, September 1977.

(d) Need not meet the requirements of paragraphs 3.1.6 Moisture Test, 3.1.7 Dust Test, and 3.1.8 Corrosion Test of SAE Recommended Practice J186a if it is mounted inside the vehicle.

(e) Shall provide access for convenient replacement of the bulb without the use of special tools.

S5.1.1.28 Instead of the headlamps specified by Table III, a motorcycle may be equipped with one half of any headlighting system specified in S7 which provides both a full upper beam and full lower beam, and where more than one lamp must be used, the lamps shall be mounted vertically, with the lower beam as high as practicable. When installed on a motorcycle such half system need not meet the aiming requirements specified in S7.

S5.1.1.29 Each replaceable bulb headlamp that is designed to meet the photometric requirements of SAE Recommended Practice J584, *Motorcycle Headlamps*, April 1964, and that is equipped with a light source other than a standardized replaceable light source, and that is manufactured on or after September 1, 1990 shall have the word "motorcycle" permanently marked on the lens in characters not less than 0.114 inch (3mm) in height.

[**S5.1.1.30** On a motor vehicle whose overall width is less than 80 inches:

(a) The functional lighted lens area of a single compartment stop lamp, and a single compartment rear turn signal lamp, shall be not less than 50 square centimeters.

(b) If a multiple compartment lamp or multiple lamps are used to meet the photometric requirements for stop lamps and rear turn signal lamps, the functional lighted lens area of each compartment or lamp shall be at least 22 square centimeters, provided the combined area is at least 50 square centimeters. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)**]

[**S5.1.1.31** On a motor vehicle, except a passenger car, whose overall width is 80 inches or more, measurements of the functional lighted lens area, and of the photometrics, of a multiple compartment stop lamp, and a multiple compartment turn signal lamp, shall be made for the entire lamp and not for the individual compartments. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)**]

S5.1.2 Plastic materials used for optical parts such as lenses and reflectors shall conform to SAE *Recommended Practice* J576c, May 1970, except that:

(a) Plastic lenses used for inner lenses or those covered by another material and not exposed directly to sunlight shall meet the requirements of paragraphs 3.4 and 4.2 of SAE J576c, when covered by the outer lens or other material;

(b) After the outdoor-exposure test, the haze and loss of surface luster of plastic materials used

for lamp lenses shall not be greater than 30 percent haze as measured by ASTM-1003-61, *Haze and Luminous Transmittance of Transparent Plastic*; and

(c) After the outdoor exposure test, plastic materials used for reflex reflectors shall meet the appearance requirements of paragraph 4.2.2 of SAE J576c.

S5.1.3 No additional lamp, reflective device, or other motor vehicle equipment shall be installed that impairs the effectiveness of lighting equipment required by this standard.

S5.1.4 Each school bus shall be equipped with a system of either:

(a) Four red signal lamps designed to conform to SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, and installed in accordance with that standard; or

(b) Four red signal lamps designed to conform to SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, and four amber signal lamps designed to conform to that standard, except for their color, and except that their candlepower shall be at least 2½ times that specified for red signal lamps. Both red and amber lamps shall be installed in accordance with SAE Standard J887, except that:

(i) Each amber signal lamp shall be located near each red signal lamp, at the same level, but closer to the vertical centerline of the bus; and

(ii) The system shall be wired so that the amber signal lamps are activated only by manual or foot operation, and if activated, are automatically deactivated and the red signal lamps automatically activated when the bus entrance door is opened.

S5.1.5 The color in all lamps, reflective devices, and associated equipment to which this standard applies shall comply with SAE Standard J578c, *Color Specification for Electric Signal Lighting Devices,* February 1977.

S5.2. Other requirements.

S5.2.1. The words "it is recommended that," "recommendations," or "should be" appearing in any SAE Standard or Recommended Practice referenced or subreferenced in this standard shall be read as setting forth mandatory requirements, except that the aiming pads on the lens face and the black area surrounding the signal lamp, recommended in SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, are not required.

S5.2.2 The words "Type 1 (5¾")," "Type 2 (5¾")," "Type 2 (7")," "Type 1A," "Type 2A," and "Type 2B" appearing in any SAE Standard or Recommended Practice referenced or subreferenced in this standard shall also be read as setting forth requirements respectively for the following types of headlamps: 1C1, 2C1, 2D1, 1A1, 2A1, and 2B1.

S5.3. Location of required equipment.

5.3.1 Except as provided in succeeding paragraphs of S5.3.1 [and S7] each lamp, reflective device, and item of associated equipment shall be securely mounted on a rigid part of the vehicle other than glazing that is not designed to be removed except for repair, in accordance with the requirements of Tables I or III [as applicable, and S7, and in the location] specified in Table II (multipurpose passenger vehicles, trucks, trailers, and buses 80 or more inches in overall width) and Table IV (all passenger cars, and motorcycles, and multipurpose passenger vehicles, trucks, trailers, and buses less than 80 inches in overall width), as applicable. **(54 F.R. 30223—July 19, 1989. Effective: July 19, 1989)**

S5.3.1.1 Except as provided in S5.3.1.1.1, each lamp and reflective device shall be located so that it meets the visibility requirements specified in any applicable SAE Standard or Recommended Practice. In addition, no part of the vehicle shall prevent a parking lamp, taillamp, stop lamp, turn-signal lamp, or backup lamp from meeting its photometric output at any applicable group of test points specified in Figures 1c and 2, or prevent any other lamp from meeting the photometric output at any test point specified in any applicable SAE Standard or Recommended Practice. However, if motor vehicle equipment (e.g., mirrors, snow plows, wrecker booms, backhoes, and winches) prevents compliance with this paragraph by any required lamp or reflective devices, an auxiliary lamp or device meeting the requirements of this paragraph shall be provided.

S5.3.1.1.1 Clearance lamps may be mounted at a location other than on the front and rear if necessary to indicate the overall width of a vehicle, or for protection from damage during normal operation of the vehicle, and at such a location they need not be visible at 45 degrees inboard.

S5.3.1.2 On a truck tractor, the red rear reflex reflectors may be mounted on the back of the cab, at a minimum height not less than 4 inches above the height of the rear tires.

S5.3.1.3 On a trailer, the amber front side reflex reflectors and amber front side-marker lamps may be located as far forward as practicable exclusive of the trailer tongue.

S5.3.1.4 When the rear identification lamps are mounted at the extreme height of a vehicle, rear clearance lamps need not meet the requirement of Table II that they be located as close as practicable to the top of the vehicle.

S5.3.1.5 The center of the lens referred to inSAE Standard J593c, *Backup Lamps,* February1968, is the optical center.

S5.3.1.6 On a truck tractor, clearance lamps mounted on the cab may be located to indicate the width of the cab, rather than the overall width of the vehicle.

S5.3.1.7 [On a motor vehicle on which the front turn signal lamp is less than 100 mm from the lighted edge of a lower beam headlamp, as measured from the optical center of the turn signal lamp, the multiplier applied to obtain the required minimum luminous intensities shall be 2.5. **(55 F.R. 50182—December 5, 1990. Effective: December 1, 1991)**]

S5.3.1.8 Each high-mounted stop lamp shall be mounted with its center on the vertical centerline of the passenger car as the car is viewed from the rear. The lamp may be mounted at any position on the centerline, including the glazing. If the lamp is mounted inside the vehicle, means shall be provided to minimize reflections from the light of the lamp upon the rear window glazing that might be visible to the driver when viewed directly, or indirectly in the rearview mirror. If the lamp is mounted below the rear window, no portion of the lens shall be lower than 6 inches below the rear window on convertibles, or 3 inches on other passenger cars.

S5.4 Equipment combinations. Two or more lamps, reflective devices, or items of associated equipment may be combined if the requirements for each lamp, reflective device, and item of associated equipment are met, except that no clearance lamp may be optically combined with any taillamp, and no high-mounted stop lamp shall be combined with any other lamp or reflective device.

S5.4.1. [Removed]

(55 F.R. 46669 November 6, 1990)

S5.5. Special wiring requirements.

S5.5.1. Each vehicle shall have a means of switching between lower and upper beams that conforms to SAE Recommended Practice J564a, *Headlamp Beam Switching,* April 1964, or to SAE Recommended Practice J565b, *Semi-Automatic Headlamp Beam Switching Devices,* February 1969. Except as provided in S5.5.8, the lower and upper beams shall not be energized simultaneously except momentarily for temporary signalling purposes or during switching between beams.

S5.5.2 Each vehicle shall have a means for indicating to the driver when the upper beams of the headlamps are on that conforms to SAE Recommended Practice J564a, April 1964, except that the signal color need not be red.

S5.5.3 The taillamps on each vehicle shall be activated when the headlamps are activated in a steady-burning state.

S5.5.4 The stoplamps on each vehicle shall be activated upon application of the service brakes. The high-mounted stoplamp on each passenger car shall be activated only upon application of the service brakes.

S5.5.5 The vehicular-hazard warning-signal operating unit on each vehicle shall operate independently of the ignition or equivalent switch, and when activated, shall cause to flash simultaneously sufficient turn signal lamps to meet, as a minimum, the turn signal lamp photometric requirements of this standard.

S5.5.6 Each vehicle equipped with a turn signal operating unit shall also have an illuminated pilot indicator. Failure of one or more turn signal lamps to operate shall be indicated in accordance with SAE

Standard J588e, *Turn Signal Lamps,* September 1970, except when a variable-load turn signal flasher is used on a truck, bus, or multipurpose passenger vehicle 80 or more inches in overall width, on a truck that is capable of accommodating a slide-in camper, or on any vehicle equipped to tow trailers.

S5.5.7. On each passenger car, and motorcycle, and multipurpose passenger vehicle, truck, and bus of less than 80 inches overall width:

(a) When the parking lamps are activated, the taillamps, license plate lamps, and side marker lamps shall also be activated; and

(b) When the headlamps are activated in a steady-burning state, the taillamps, parking lamps, license plate lamps and side marker lamps shall also be activated.

S5.5.8. On a motor vehicle equipped with a headlighting system designed to conform to the photometric requirements of Figure 15, the lamps marked "L" or "LF" may be wired to remain permanently activated when the lamps marked "U" or "LF" are activated. On a motor equipped with an Integral Beam headlighting system meeting the photometric requirements of section S7.4(a)(1)(ii), the lower beam headlamps shall be wired to remain permanently activated when the upper beam headlamps are activated.

S5.5.9. [Except as provided in Section S5.5.8, the wiring harness or connector assembly of each headlamp system shall be designed so that only those light sources intended for meeting lower beam photometrics are energized when the beam selector switch is in the lower beam position, and that only those light sources intended for meeting upper beam photometrics are energized when the beam selector switch is in the upper beam position. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)**]

S5.5.10. The wiring requirements for lighting equipment in use are:

(a) Turn signal lamps, hazard warning signal lamps, and school bus warning lamps shall be wired to flash;

[(b)] Headlamps and side-marker lamps may be wired to flash for signalling purposes;

[(c)] A motorcycle headlamp may be wired to allow either its upper beam or its lower beam, but not both, to modulate from a higher intensity to a lower intensity in accordance with Section S4.6;

[(d)] All other lamps shall be wired to be steady-burning. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)**]

S5.6. Motorcycle headlamp modulation system.

S5.6.1. A headlamp on a motorcycle may be wired to modulate either the upper beam or the lower beam from its maximum intensity to a lesser intensity provided that:

(a) The rate of modulation shall be 240 ± 40 cycles per minute.

(b) The headlamp shall be operated at maximum power for 50 to 70 percent of each cycle.

(c) The lowest intensity at any test point shall be not less than 17 percent of the maximum intensity measured at the same point.

(d) The modulator switch shall be wired in the power lead of the beam filament being modulated and not in the ground side of the circuit.

(e) Means shall be provided so that both the lower beam and upper beam remain operable in the event of a modulator failure.

(f) The system shall include a sensor mounted with the axis of its sensing element perpendicular to a horizontal plane. Headlamp modulation shall cease whenever the level of light emitted by a tungsten filament light operating at 3000° Kelvin is either less than 270 lux (25 footcandles) of direct light for upward pointing sensors or less than 60 lux (5.6 footcandles) of reflected light for downward pointing sensors. The light is measured by a silicon cell type light meter that is located at the sensor and pointing in the same direction as the sensor. A Kodak Gray Card (Kodak R-27) is placed at ground level to simulate the road surface in testing downward-pointing sensors.

(g) When tested in accordance with the test profile shown in Figure 9, the voltage drop across the modulator when the lamp is on at all test conditions for 12-volt systems and 6-volt systems shall not be greater than .45 volt. The modulator shall meet all the provisions of the standard after completion of the test profile shown in Figure 9.

(h) Means shall be provided so that both the lower and upper beam function at design voltage

when the headlamp control switch is in either the lower or upper beam position when the modulator is off.

S5.6.2. (a) Each motorcycle headlamp modulator not intended as original equipment, or its container, shall be labeled with the maximum wattage, and the minimum wattage, appropriate for its use. Additionally, each such modulator shall comply with S5.6.1 (a) through (g) when connected to a headlamp of the maximum rated power and a headlamp of the minimum rated power and shall provide means so that the modulated beam functions at design voltage when the modulator is off.

(b) Instructions, with a diagram, shall be provided for mounting the light sensor including location on the motorcycle, distance above the road surface, and orientation with respect to the light.

S5.7. Replacement equipment.

S5.7.1. Each lamp, reflective device, or item of associated equipment manufactured to replace any lamp, reflective device, or item of associated equipment on any vehicle to which this standard applies, shall be designed to conform with this standard.

S5.7.2. Unless otherwise specified in this standard, each lamp, reflective device, or item of associated equipment to which section S5.7.1 applies may be labeled with the symbol DOT, which shall constitute a certification that it conforms to applicable Federal motor vehicle safety standards.

S6. Subreferenced SAE Standards and Recommended Practices.

S6.1. SAE Standards and Recommended Practices subreferenced by the SAE Standards and Recommended Practices included in Tables I and III and paragraphs S5.1.4 and S5.5.1 are those published in the 1970 edition of the SAE Handbook, except that the SAE standard referred to as "J575" is J575e, *Tests for Motor Vehicle Lighting Devices and Components,* August 1970, [for stoplamps, designed to conform to SAE Standards J586c, J586 FEB84, and J1398 MAY85; for taillamps designed to conform to SAE Standards J585d and J585e; for turn signal lamps designed to conform to SAE Standards J588e, J588 NOV84, and J1395 APR85; and for high-mounted stoplamps designed to conform to SAE Recommended Practice J186a.] The reference in J585e to J256 does not apply. For headlamps, unless otherwise specified in this standard, the version of SAE Standard J575 is JUN 80, and the version of SAE Standard J602 is OCT 80. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

S6.2. Requirements of SAE Standards incorporated by reference in this standard, other than J576b and J576c, do not include tests for warpage of devices with plastic lenses.

[**S6.3.** The term "effective projected luminous lens area" has the same meaning as the term "functional lighted lens area" in any SAE Standard or Recommended Practice incorporated by reference or by subreference in this standard. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

[S7. Headlighting requirements.

[**S7.1.** Each passenger car, multipurpose passenger vehicle, truck, and bus shall be equipped with a headlighting system designed to conform to the requirements of S7.3, S7.4, or S7.5. **(54 F.R. 20006—May 9, 1989. Effective: June 8, 1989)]**

S7.2. [(a) The lens of each original and replacement equipment headlamp, and of each original equipment and replacement equipment beam contributor manufactured on or after December 1, 1989, shall be marked with the symbol "DOT," either horizontally or vertically which shall constitute the certification required by 15 U.S.C. 1403.

(b) The lens of each headlamp and of each beam contributor manufactured on or after December 1, 1989, to which paragraph (a) of this section applies shall be marked with the name and/or trademark registered with the U.S. Patent and Trademark Office of the manufacturer of such headlamp or beam contributor, or its importer, or any manufacturer of a vehicle equipped with such headlamp or beam contributor. Nothing in this paragraph shall be construed to authorize the marking of any such name and/or trademark by one who is not the owner, unless the owner has consented to it.

(c) Each headlamp and beam contributor to which paragraph (a) of this section applies shall be marked with its voltage and with its part or trade number.

S7.3 Sealed beam headlighting system. A sealed beam headlighting system shall be designed to

meet the requirements of one of the following subparagraphs of S7.3.2 through S7.3.9. In references to Figures in SAE J1383 APR 85 for headlamp dimensional requirements, only those dimensions marked "I" for interchangeability are applicable.

S7.3.1 The lens of each sealed beam headlamp designed to conform to S7.3.2 through S7.3.6 shall be marked according to paragraph 5.4.3 through 5.4.5 of SAE Standard J1383 April 85 *Performance Requirements for Motor Vehicle Headlamps.*

S7.3.2 Type A headlighting system. A Type A headlighting system consists of two Type 1A1 and two Type 2A1 headlamps and associated hardware, which are designed to conform to the following requirements:

(a) SAE Standard J1383 APR 85 *Performance Requirements for Motor Vehicle Headlamps*, with the following exceptions:

(1) Paragraphs 1, 2.1.2, 2.8.2, 3, 4.1.1, 4.1.2, 4.1.3, 4.4, 4.6, 4.8 through 4.18, 5.1.1, 5.1.3, 5.1.5, 5.1.7 through 5.1.16, 5.2.2, 5.3.5, 5.4.1, 5.4.2, and 6 through 6.4 do not apply.

(2) In paragraph 5.3.2, the words "and retaining rings" are omitted.

(3) In paragraphs 4.5.2 and 5.1.6, the words "either Table 1 or Table 2 of SAE J579 DEC 84 as appropriate" are substituted for "Table 3."

(b) SAE Standard J580 DEC 86 *Sealed Beam Headlamp Assembly* (except paragraphs 3, 4.1.1, 5.1.1.1, 5.1.2.3, and the second sentence of 5.1.6); in 5.2.1, delete the words "and retaining rings;" the correct reference is SAE J1383 Figure 6, 9, 12 and 14.

(c) After a vibration test conducted in accordance with paragraph S8.9, there shall be no evidence of loose or broken parts, other than filaments, visible without magnification.

(d) The maximum wattage at 12.8 volts (design voltage): Single filament headlamp, 55 watts on the upper beam; dual filament headlamp, 43 watts on the upper beam and 65 watts on the lower beam.

S7.3.3 Type B headlighting system. A Type B headlighting system consists of two Type 2B1 headlamps and associated hardware, which are designed to conform to the following requirements:

(a) The requirements of paragraphs S7.3.2(a) through (c).

(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on the upper beam and 60 watts on the lower beam.

S7.3.4 Type C headlighting system. A Type C headlighting system consists of two Type 1C1 and two Type 2C1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2(a) through (d).

S7.3.5 Type D headlighting system. (a) A Type D headlighting system consists of two Type 2D1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2(a) through (c).

[(b) The maximum wattage at 12.8 volts (design voltage): 65 watts on upper beam, and 55 watts on lower beam. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

S7.3.6 Type E headlighting system. (a) A Type E headlighting system consists of two Type 2E1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2(a) through (c).

[(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on upper beam, and 60 watts on lower beam. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

S7.3.7 Type F headlighting system. A Type F headlighting system consists of two Type UF and two Type LF headlamps and associated hardware, which are designed to conform to the following requirements:

(a) Figures 11, 12, 13, and 14 as appropriate.

(b) The photometric requirements of Figure 15 of this standard. A reaim tolerance of +/− ¼ degree is allowed for any test point on the Type LF lamp when tested alone, but is not allowed on the Type UF lamp when tested alone. For the test point 10U-90U, measurement shall be from the normally exposed surface of the lens face.

(c) SAE Standard J1383 APR 85 *Performance Requirements for Motor Vehicle Headlamps*, Sections 2.4, 2.5, 2.6, 4.1, 4.1.4 and [5.1.4].

(d) When tested in accordance with section (c), the mounted assembly (either Type UF or Type LF headlamps, respective mounting ring, aiming ring, and aim adjustment mechanism) shall be designed to conform to the requirements of Figure 15 for upper or lower beams respectively without reaim

when any conforming Type UF or LF headlamp is tested and replaced by another conforming headlamp of the same Type.

(e) SAE J580 DEC 86 *Sealed Beam Headlamp Assembly* with the following exceptions:

(1) Section 2.2 Mounting Ring reads: "the adjustable ring upon which the sealed beam unit is mounted and which forces the sealed beam unit to seat against the aiming ring when assembled into a sealed beam assembly."

(2) The definition "2.3 Aiming Ring" reads: "The clamping ring that retains the sealed beam unit against the mounting ring, and that provides an interface between the unit's aiming/seating pads and the headlamp aimer adapter (locating plate)."

(3) Section 4.1.1 Vibration Test does not apply.

(4) Section 5.1.1.1 [and 5.1.2.3 do] not apply.

(5) Section 5.1.2.1 reads: "When the headlamp assembly is tested in the laboratory, a minimum aiming adjustment of +/− 2.5 degrees shall be provided in the horizontal plane and +/− 4 degrees in the vertical plane."

(6) Section 5.1.2.2 concludes:". . . through and angle of +/− 2.5 degrees and +/− 4 degrees respectively."

(7) Section 5.1.6 is retitled "Retaining Ring/Aiming Ring Tests." The phrase "92 x 150mm . . .0.340 in (8.6 mm)" is added at the end of the table for flange thickness. The sentence beginning 'The fastening means' is deleted. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

(8) Figures 2, 3, and 4 do not apply, and the reference to them in section 4.5 is replaced by "Figure 16, Deflectometer, of Federal Motor Vehicle Safety Standard No. 108."

(f) A lens for a Type F headlamp incorporating an upper beam shall be labeled "UF". A lens for a Type F headlamp incorporating a lower beam shall be labeled "LF". The face of letters, numbers, or other symbols molded on the surface of the lens shall not be raised more than 0.020 in (0.5 mm), and shall be placed no closer to the photometric center of the lens than 2.75 in (70 mm.). The marking shall be molded in the lens and shall be not less than ¼ in. (6.35 mm.) in size.

(g) The maximum wattage at 12.8 volts (design voltage): 70 watts on the upper beam and 60 watts on the lower beam.

(h) Type F headlamps may be mounted on common or parallel seating and aiming planes to permit simultaneous aiming of both headlamps provided that when tested with any conforming Type UF and LF headlamps according to Section S10:

(1) The assembly (consisting of the Type UF and LF headlamps, mounting rings, the aiming/seating rings, and aim adjustment mechanism), shall be designed to conform to the test point values of Figure 15.

(2) There shall be no provision for adjustment between the common or parallel aiming and seating planes of the two lamps.

(i) After a vibration test conducted in accordance with paragraph S8.9, the Type F system shall show no evidence of loose or broken parts, other than filaments, visible without magnification.

[**S7.3.8 Type G headlighting system.** A Type G headlamp system consists of two Type 1G1 headlamps and two Type 2G1 headlamps each of which is designed to conform to the following requirements:

(a) Figures 18 and 21.

(b) SAE Standard J1383 APR 85 *Performance Requirements for Motor Vehicle Headlamps* (except paragraphs 1, 2.1.2, 2.8.2, 3, 4.1.1, 4.1.2, 4.1.3, 4.4, 4.6, 4.8 through 4.18, 5.1.1, 5.1.3, 5.1.5 through 5.1.16, 5.2.2, 5.3.5 through 6.4). In paragraph 5.3.2 the words "and retaining rings" are omitted. In paragraph 4.5.2, the words either Table 1 or Table 2 or SAE J579 DEC 84, as appropriate" are substituted for the words "Table 3."

(c) SAE Standard J580 DEC 86 *Sealed Beam Headlamp Assembly*, with the following exception:

(1) Sections 2.2, 2.3, 4.1.1, 5.1.1.1, 5.1.2.3, 5.1.6 and 5.2.1.

(2) Section 4.5 reads: "*Torque Deflection Test.* The headlamp assembly to be tested shall be mounted in the designed vehicle position and set at nominal aim (0.0). A special adapter (Figure 22) for the deflectometer (Figure 3) shall be clamped onto the headlamp assembly. A torque of 20 in.-lbs. (2.25 N-m) shall be applied to the headlamp assembly through the deflectometer, and a reading on the thumb wheel shall be taken. The torque shall be removed and a second reading on the thumb wheel shall be taken."

(d) After a vibration test conducted in accordance with paragraph S8.9, there shall be no evidence of loose or broken parts, other than filaments, visible without magnification.

(e) The maximum wattage at 12.8 volts (design voltage) for the 1G1 and 2G1 upper beam is 55 watts and 43 watts respectively; for the 2G1 lower beam, 65 watts.

(f) A lens for a Type G headlamp incorporating only part of an upper beam shall be labeled 1G1. A lens for a Type G headlamp incorporating both parts of an upper beam and a lower beam shall be labeled 2G1. The face of letters, numbers, or other symbols molded on the surface of the lens shall not be raised more than 0.020 in. (0.5 mm.), and shall be placed no closer to the geometric center of the lens than 2.75 in. (70 mm.). The marking shall be molded in the lens and shall be not less than ¼ in. (6.35 mm) in size.

S7.3.9 Type H headlighting system. A Type H headlamp system consisting of two Type 2H1 headlamps and associated hardware, which are designed to conform to the following requirements:

(a) Paragraph S7.3.8(a) through (d).

(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on the upper beam and 60 watts on the lower beam.

(c) A lens for a Type H headlamp incorporating both an upper beam and a lower beam shall be labeled 2H1. The face of letters, numbers, or other symbols molded on the surface of the lens shall not be raised more than 0.020 in. (0.5 mm), and shall be placed no closer to the geometric center of the lens than 2.75 in. (70 mm.) The marking shall be molded in the lens and shall be not less than ¼ in. (6.35 mm) in size.

S7.4 Integral Beam Headlighting System. An integral beam headlighting system shall be designed to conform to the following requirements:

(a) The system shall provide in total not more than two upper beams and two lower beams of the performance described in one of the following:

(a)(1) In a four-headlamp system, each upper beam headlamp and each lower beam headlamp shall be designed to conform to the photometrics of one of the following:

(i) Figure 15;

(ii) Figure 15 except that the upper beam test values at 2½ D-V and 2½ D-12R and 12L shall apply to the lower headlamp [and not to the upper beam headlamp, and the upper beam test point. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

(iii) Table 2 of SAE J579 DEC 84.

(a)(2) In a two-headlamp system, each headlamp shall be designed to conform to the photometrics of one of the following:

(i) Figure 17; or

(ii) Table 1 of SAE J579 DEC 84.

(a)(3) In a system in which there is more than one beam contributor providing a lower beam, and /or more than one beam contributor providing an upper beam, each beam contributor in the system shall be designed to meet only the photometric performance requirements of [Figure 15] based upon the following mathematical expression: conforming test point value = 2 (Figure 15 test point value)/total number of lower or upper beam contributors for the vehicle, as appropriate. The system shall be designed to use the Vehicle Headlamp Aiming Device (VHAD) as specified in paragraph S7.7.5.2.

(b) The lower and upper beams shall be provided only as follows where each headlamp contains two light sources:

(1) The lower beam shall be provided either by the most outboard light source (or the uppermost if arranged vertically), or by all light sources.

(2) The upper beam shall be provided either by the most inboard light source (or the uppermost if arranged vertically), or by all light sources.

(c) The lower and upper beams shall be provided only as follows where each headlamp contains a signal light source.

(1) The lower beam shall be provided by the most outboard headlamps (or the uppermost if arranged vertically), and the lens of each such headlamp shall be permanently marked with the letter "L."

(2) The upper shall be provided by the most inboard headlamps (or lowermost if arranged vertically), and the lens of each such headlamp shall be permanently marked with the letter "U."

(d) A tolerance of +/− ¼ degree reaim tolerance during photometric performance tests is permitted for any headlamp. The test points 10U-90U shall be measured from the normally exposed surface of the lens face.

(e) A headlamp or beam contributor designed to meet paragraphs (a)(1) or (a)(3) of this section and S7.7.5.1 may be mounted in an assembly to permit simultaneous aiming of the beam(s) contributors, provided that with any complying contributor the assembly complete with all lamps meets the appropriate photometric requirements when tested in accordance with S10.

(f) Each integral beam headlamp system shall be designed to conform to the applicable photometric performance requirements in paragraph (a) of this section when tested in accordance with Sections 4.1 and 4.1.4 of SAE Standard J1383 APR 85 with any headlamp intended for use in such system. The term "aiming plane" means "aiming reference plane," or an appropriate vertical plane defined by the manufacturer as required in paragraph S7.7.1.

(g) The system shall be aimable in accordance with the requirements of paragraph S7.7. A system that incorporates any headlamp or beam contributor that does not have a VHAD as an integral and indivisible part of the headlamp or beam contributor shall be designed so that the appropriate photometrics are met when any correctly aimed and photometrically conforming headlamp or beam contributor is removed from its mounting and aiming mechanism, and is replaced without reaim by any conforming headlamp or beam contributor of the same type.

(h) A headlamp with a glass lens need not meet the abrasion resistance (S8.2), chemical resistance (S8.3), or impact (S8.8) tests. If, in addition to a glass lens, the headlamp uses a non-plastic reflector. it need not meet the internal heat test of paragraph S8.6.2. A headlamp of sealed design as verified in paragraph S8.10 *Sealing* need not meet the corrosion (S8.4), dust (S8.5), or humidity (S8.7) tests, however, the headlamp shall meet the requirements of paragraphs 4.1, 4.1.2, 4.4 and 5.1.4 for corrosion and connector of SAE Standard J580 DEC 86 *Sealed Beam Headlamp Assembly*.

[(i)] When tested according to any of the procedures indicated in subparagraphs (i) through (viii) each headlamp or beam contributor shall meet the appropriate requirement:

(i) After an abrasion test conducted in accordance with paragraph S8.2, the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(ii) After a chemical resistance test involving exposure to any of the fluids listed in paragraph S8.3, there shall be no surface deterioration, coating delamination, fractures, deterioration of bonding materials, color bleeding or color pickup visible without magnification, and the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(iii) After a corrosion test conducted in accordance with paragraph S8.4 there shall be no evidence of external or internal corrosion or rust visible without magnification. Loss of adhesion of any applied coating shall not occur more than 0.125 in. (3.2 mm) from any sharp edge on the inside or outside. Corrosion may occur on terminals only if the current produced during the test of paragraph S8.4(c) is not less than 9.7 amperes.

(iv) After a dust test conducted in accordance with paragraph S8.5, the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(v) The headlamp shall first meet the requirements of subparagraph (A) and then those of subparagraph (B).

(A) After a temperature cycle test conducted in accordance with paragraph S8.6.1, the headlamp shall show no evidence of delamination, fractures, entry of moisture or deterioration of bonding material, color bleeding, warpage or deformation visible without magnification or lens warpage greater than .118 in (3 mm) when measured parallel to the optical axis at the point of intersection of the axis of each light source with the exterior surface of the lens, and its shall meet the photometric requirements applicable to the headlamp system under test.

(B) After an internal heat test conducted in accordance with paragraph S8.6.2, there shall be no lens warpage greater than .118 in (3 mm) when measured parallel to the optical axis at the point of intersection of the axis of each light source with the exterior surface of the lens, and it shall meet the photometric requirements applicable to the headlamp system under test.

(vi) After a humidity test conducted in accordance with paragraph S8.7, the inside of the headlamp shall show no evidence of delamination or moisture, fogging or condensation visible without magnification, and the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(vii) After an impact test on a headlamp with a plastic lens, conducted in accordance with paragraph S8.8, there shall be no fracture of the adhesion of the lens coating or delamination of materials visible without magnification, and the lens shall not be broken, cracked, or chipped.

(viii) After a vibration test conducted in accordance with paragraph S8.9, there shall be no evidence of loose or broken parts, other than filaments, visible without magnification.

S7.5 Replaceable Bulb Headlamp System. Each replaceable bulb headlamp system shall be designed to conform to the following requirements:

(a) The system shall provide only two lower beams and two upper beams and shall incorporate not more than two standardized replaceable light sources in each headlamp.

(b) [The photometrics as specified in paragraphs (c) through (e) of this section (depicted in Figure 26), using any standardized light source of the Type intended for use in such system. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(c) [The test requirements of sections 4.1, 4.1.4, and performance requirements of section 5.1.4 of SAE J1383 April 85, using the photometric requirements specified in paragraphs (d) and (e) of this section.] The term "aiming plane" means "aiming reference plane," or an appropriate vertical plane defined by the manufacturer as required in paragraph S7.7.1. A ¼ degree reaim tolerance is permitted for any test point. The test points 10U-90U shall be measured from the normally exposed surface of the lens face. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(d) [For a headlamp system equipped with dual filament light sources, Type HB1 light sources, Type HB2 light sources, Type HB5 light sources, or Types HB1 and HB5 in combination, the following requirements apply:

(1) Headlamps designed to conform to the external aiming requirements of S7.7.5.1 shall have no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(2) The lower and upper beams of a headlamp system consisting of two lamps, each containing one or two light sources, shall be provided as follows:

(i) The lower beam shall be provided in one of the following ways:

(A) By the outboard light source (or upper one if arranged vertically) designed to conform to:

(1) the lower beam requirements of Figure 17, if the light sources are type HB2; or

(B) Both light sources, in the headlamp designed to conform to the lower beam requirements specified above for their Type.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to:

(1) the upper beam requirements of Table 1 of SAE Standard J579 DEC84, if the light sources are only Type HB1; or Type HB5, or a combination thereof; or

(2) the upper beam requirements of Figure 17, if the light sources are Type HB2; or

(B) By both light sources in the headlamp, designed to conform to the upper beam photometrics specified above for their type.

(3) The lower and upper beams of a headlamp system consisting of four lamps, each containing a single light source, shall be provided as follows:

(i) The lower beam shall be provided by the outboard lamp (or upper one if arranged vertically), designed to conform to:

(A) the lower beam requirements of Table 1 of SAE Standard J579 DEC 84, if the light sources are only Type HB1; or Type HB5, or a combination thereof; or

(B) the lower beam requirements of Figure 15, if the light sources are Type HB2. The lens of each such headlamp shall be marked with the letter "L."

(ii) The upper beam shall be provided by the inboard lamp (or the lower one if arranged vertically), designed to conform to:

(A) the upper beam requirements of Table 1 of SAE Standard J579 DEC 84, if the light sources are only Type HB1; or Type HB5, or a combination thereof; or

(B) the upper beam requirements of Figure 15, if the light sources are Type HB2. The lens of each such headlamp shall be marked with the letter "U."

(e) [The following requirements apply to a headlamp system equipped with any combination of light sources except those specified in paragraph (d) of this section: **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(1) There shall be no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector.

(2) The lower and upper beams of a headlamp system consisting of two lamps, each containing two light sources [(other than those specified in paragraph (d) of this section)] shall be provided only as follows: **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(i) The lower beam shall be provided in one of the following ways:

(A) By the outboard light source (or the uppermost if arranged vertically) designed to conform to the lower beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the lower beam requirements of Figure 17.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to the upper beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the upper beam requirements of Figure 17.

(3) [The lower and upper beams of a headlamp system consisting of four lamps, using any combination of light sources except those specified in paragraph (d) of this section, each lamp containing only a single light source, shall be provided only as follows: **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "L."

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Figure 15. The lens of each such headlamp shall be marked with the letter "U."

(f) Each lens reflector unit manufactured as replacement equipment shall be designed to conform to the requirements of paragraphs (d) and (e) of this section when any standardized replaceable light source appropriate for such unit is inserted in it.

(g) [The lens of each replaceable bulb headlamp using any Type light source, except HB1 used singly or dually, within a headlamp system on a motor vehicle, shall permanently display the Type designation for that light source on the lens in front of each light source. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(h) The system shall be aimable in accordance with paragraph S7.7.

(i) Each headlamp shall meet the requirements of paragraphs S7.4(h) and (i), except that the sentence in (h) to verify sealing according to S8.10 *Sealing* does not apply.

S7.6 Standardized Replaceable Light Sources. Each standardized replaceable light source shall be designed to conform to the following requirements:

(a) A Type HB1 light source shall be designed to conform to the dimensions specified in Figure 3 and shall incorporate a silicone O-ring. Its maximum power on the lower beam shall be 50 watts, and on the upper beam, 70 watts. Its luminous flux in lumens shall be 700 +/− 15% on the lower beam and 1200 +/− 15% on the upper beam.

(b) A Type HB2 light source shall be designed to conform to the dimensions specified in Figure 23. Its maximum power on the lower beam shall be 65 watts, and on the upper beam, 72 watts. Its luminous flux in lumens shall be 910 plus or minus 10% on the lower beam, and 1500 plus or minus 10% on the upper beam.

(c) A Type HB3 light source shall be designed to conform to the dimensions specified in Figure 19. Its maximum power on the upper beam shall be 70 watts. Its luminous flux in lumens shall be 1700 +/− 12%.

(d) A Type HB4 light source shall be designed to conform to the dimensions specified in Figure 20. Its maximum power shall be 60 watts on the lower beam, and its luminous flux in lumens on the lower beam shall be 1000 +/− 15%.

(e) [A Type HB5 light source shall be designed to conform to the diemensions specified in Figure 24. Its maximum power shall be 60 watts on the lower beam, and 70 watts on the upper beam. Its luminous flux in lumens shall be 1000 +/− 15% on the lower beam, and 1350 +/− 15% on the upper beam. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(f) [The filament of a light source shall be seasoned before measurement of maximum power and luminous flux. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

[(g)] Measurement of maximum power and luminous flux shall be made with the direct current test voltage regulated within one quarter of one percent. The test voltage shall be design voltage, 12.8v. The measurement of luminous flux shall be in accordance with the Illuminating Engineering Society of North America, LM-45; *IES Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps* (April 1980), shall be made with the black cap installed on [Types HB1, HB2, and HB4, and Type HB5, and shall be made with the electrical conductor and light source base shrouded with an opaque white colored cover, except for the portion normally located within the interior of the lamp housing. The measurement of luminous flux for the Types HB3 and HB4 shall be with the base covered with a white cover shown in Figures 19-1 and 20-1. The white covers are used to eliminate the likelihood of incorrect lumen measurement that will occur should the reflectance of the light source base and electrical connector be low.

[(h) The capsule, lead wires and/or terminals, and seal on each Type HB1, Type HB3, Type HB4, and Type HB5 light source shall be installed in the base as shown in Figure 25 so as to provide an airtight seal. Such a seal exists when no air bubbles shall appear on the low pressure (connector) side after the light source has been immersed in water for one minute while inserted in a cylindrical aperture specified for the light source in Figure 25, and subjected to an air pressure of 70 kPa (10 P.S.I.G.) on the glass capsule side. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

[(i)] After the force deflection test conducted in accordance with S9, the permanent deflection of the glass envelope shall not exceed 0.005 in. (0.13mm) in the direction of the applied force.

[(j)] A general tolerance shall apply to Figure 3 as follows: +/− 0.004 in. (0.10 mm) to all linear dimensions and +/− 1 degree 00 minutes to all angular dimensions except for referenced dimensions and unless otherwise specified.

[(k) Each standardized light source manufactured on or after December 1, 1989, shall be marked with the symbol DOT and with a name or trademark in accordance with S7.2. In addition, the base of each such light source shall be marked with its HB Type designation. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

S7.7 Aimability Performance Requirements.

S7.7.1 Each headlamp (other than a headlamp designed to conform to paragraph S7.3), or beam contributor, shall be equipped with fiducial marks, aiming pads or similar references of sufficient detail and accuracy for determination of an appropriate vehicle plane to be used with the photometric procedures of SAE J1383 APR 85 for correct alignment with the photometer axis when being tested for photometric compliance, and to serve for the aiming reference when the lamp is installed on a motor vehicle. The fiducial marks, aiming pads, or similar references are protrusions, bubble vials, holes, indentations, ridges, scribed lines, or other readily identifiable marks established and described by the vehicle or lamp manufacturer.

S7.7.2 Each headlamp shall be installed on a motor vehicle with a mounting and aiming mechanism that allows aim inspection and adjustment of both vertical and horizontal aim, and is accessible for those uses without removal of any vehicle parts, except for protective covers removable without the use of tools.

S7.7.2.1. (a) When installed on the vehicle, adjustment of one aim axis through its full on-vehicle range shall not cause the aim of the other axis to deviate more than +/− 0.76 degree.

(b) If the performance specified in paragraph (a) of this section is not achievable, the requirements of paragraph S7.7.5.2(b)(3) apply, except that if the aiming mechanism is not a VHAD, the requirements specific to VHADs are not applicable, and the instructions shall be specific to the aiming mechanism installed.

[**S7.7.2.2.** If a headlamp is aimed by moving the reflector relative to the lens and headlamp

S4.4 *Non-Pneumatic Tire Identification Code and Non-Pneumatic Rim/Wheel Center Member Matching Information.* For purposes of this standard, S8 of 49 CFR 571.110 and S10 of 49 CFR 571.120, each manufacturer of a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly shall ensure that it provides a listing to the public for each non-pneumatic tire that it produces. The listing shall include the non-pneumatic tire identification code, tire load rating, dimensional specifications and a diagram of the portion of the tire that attaches to the non-pneumatic rim or wheel center member, and a list of the non-pneumatic rims or wheel center members that may be used with that tire. For each non-pneumatic rim or wheel center member included in such a listing, the information provided shall include a size and type designation for the non-pneumatic rim or wheel center member, and dimensional specifications and a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire if the non-pneumatic rim's or portion of the wheel center member's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this section. The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires or, in the case of non-pneumatic tires supplied only as a temporary spare tire on a vehicle, in a document furnished to dealers of vehicles equipped with the tires, to any person upon request, and in duplicate to the Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, or at least one of the following organizations:

The Tire and Rim Association

The European Tire and Rim Technical Organization

Japan Automobile Tire Manufacturers' Association, Inc.

Deutsche Industrie Norm

British Standards Institute

Scandinavian Tire and Rim Organization

Tyre and Rim Association of Australia

S5 *Test Procedures.*

S5.1 *Physical Dimensions.* After conditioning the tire at room temperature for at least 24 hours, using equipment with minimum measurement capabilities of one-half the smallest tolerance specified in the listing contained in the submission made by a manufacturer pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation, measure the portion of the tire that attaches to the non-pneumatic rim or the wheel center member. For any inner diameter dimensional specifications, or other dimensional specifications that are uniform or uniformly spaced around some circumference of the tire, these measurements shall be taken at least six points around the tire, or if specified, at the points specified in the listing contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S5.2 *Lateral Strength.*

S5.2.1 *Preparation of the tire.*

S5.2.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.2.1.2 Mount the tire assembly in a fixture as shown in Figure 1 with the surface of the tire assembly that would face outward when mounted on a vehicle facing toward the lateral strength test block shown in Figure 2 and force the lateral strength test block against the tire.

S5.2.2 *Test Procedure.*

S5.2.2.1 Apply a load through the block to the tire at a rate of 2 inches per minute, with the load arm parallel to the tire assembly at the time of engagement and the first point of contact with the test block being the test block centerline shown in Figure 2, at the following distances, B, in sequence, as shown in Figure 1:

B = A − 1 inch
B = A − 2 inches
B = A − 3 inches
B = A − 4 inches
B = A − 5 inches, and
B = A − 6 inches

However, if at any time during the conduct of the test, the test block comes in contact with the non-pneumatic test rim or test wheel center member, the test shall be suspended and no further testing at smaller values of the distance B shall be conducted. When tested to the above procedure, satisfying the requirements of S4.2.2.3 for all values of B greater than that for which contact between the non-pneumatic test rim or test wheel center member and the test block is made, shall constitute compliance to the requirements set forth in S4.2.2.3.

S5.3 *Tire Strength.*

S5.3.1 *Preparation of the Tire.*

S5.3.1.1 If applicable, mount the tire on a non-pneumatic test rim or test wheel center member.

S5.3.1.2 Condition the tire assembly at room temperature for at least three hours.

S5.3.2 *Test Procedures.*

S5.3.2.1 Force the test cleat, as defined in S5.3.2.2, with its length axis (see S5.3.2.2(a)) parallel to the rolling axis of the non-pneumatic tire assembly, and its height axis (see S5.3.2.2(c)), coinciding with a radius of the non-pneumatic tire assembly, into the tread of the tire at five test points equally spaced around the circumference of the tire. At each test point, the test cleat is forced into the tire at a rate of two inches per minute until the applicable minimum energy level, as shown in S4.2.2.4, calculated using the formula contained in S5.3.2.3, is reached.

S5.3.2.2 The test cleat is made of steel and has the following dimensions:

(a) Length of one inch greater than the maximum tire width of the tire.

(b) Width of one-half inch with the surface which contacts the tire's tread having one-quarter inch radius.

(c) Height of one inch greater than the difference between the unloaded radius of the non-pneumatic tire assembly and the minimum radius of the non-pneumatic rim or wheel center member, if used with the non-pneumatic tire assembly being tested.

S5.3.2.3 The energy level is calculated by the following formula:

$E = \frac{F \times P}{2}$

where

E = Energy level, inch-pounds;

F = Force, pounds; and

P = Penetration, inches

S5.4 *Tire Endurance.*

S5.4.1 *Preparation of the tire.*

S5.4.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.4.1.2 Condition the tire assembly to 100 ± 5° F. for at least three hours.

S5.4.2 *Test Procedure.*

S5.4.2.1 Mount the tire assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the maximum tire width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's non-pneumatic tire identification code designation.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5° F.

S5.4.2.3 Conduct the test at 50 miles per hour (m.p.h.) in accordance with the following schedule without interruption (the loads for the following periods are the specified percentage of the load rating marked on the tire or tire assembly):

	Percent
4 hours	85
6 hours	90
24 hours	100

S5.4.2.4 Immediately after running the tire the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.5.

S5.5 *High Speed Endurance.*

S5.5.1 After preparing the tire in accordance with S5.4.1, if applicable, mount the tire assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's load rating as marked on the tire or tire assembly.

S5.5.2 Break in the tire by running it for 2 hours at 50 m.p.h.

S5.5.3 Allow to cool to 100 ± 5° F.

S5.5.4 Test at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and 85 m.p.h. for 30 minutes.

S5.5.5 Immediately after running the tire for the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.6.

S6 *Nonconforming tires.* Any non-pneumatic tire that is designed for use on passenger cars that does not conform to all the requirements of this standard, shall not be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose.

* * * * *

12. Figures 1 and 2 are added following the text of Standard No. 129, appearing as follows:

Part 574 [Amended]

13. The first sentence of 574.4 *Applicability* is revised to read as follows:

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires, and new non-pneumatic tires and non-pneumatic tire assemblies for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948.

* * * * *

14. The first sentence of 574.5 *Tire identification requirements* is revised to read as follows:

Each tire manufacturer shall conspicuously label on one sidewall of each tire it manufactures, except tires manufactured exclusively for mileage-contract purchasers, or non-pneumatic tires or non-pneumatic tire assemblies, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number

containing the information set forth in paragraphs (a) through (d) of this section.

* * * * *

15. Section 574.5 is amended by adding the following to the end of the opening paragraph:

* * * * *

Each manufacturer of a non-pneumatic tire or a non-pneumatic tire assembly shall permanently mold, stamp, or otherwise permanently mark into or onto one side of the non-pneumatic tire or non-pneumatic tire assembly a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by the Federal motor vehicle safety standards shall be positioned relative to the tire identification number as shown in Figure 1, and the symbols to be used for the other information are those listed above. The labeling for a non-pneumatic tire or a non-pneumatic tire assembly shall be in the manner specified in Figure 1 and positioned on the non-pneumatic tire or non-pneumatic tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of the non-pneumatic rim or wheel center member designated for use with that non-pneumatic tire in S4.4 of Standard No. 129 (49 CFR 571.129).

16. Section 574.5(b) is amended by adding the following after the opening sentence:

* * * * *

For a new non-pneumatic tire of a non-pneumatic tire assembly, the second group, of not more than two symbols, shall be used to identify the non-pneumatic tire identification code.

* * * * *

17. Section 574.6, *Identification Mark,* is revised to read as follows:

* * * * *

To obtain the identification mark required by 574.5(a), each manufacturer of new or retreaded pneumatic tires, non-pneumatic tires, or non-pneumatic tire assemblies shall apply in writing to "Tire Identification and Recordkeeping," National Highway Traffic Safety Administration, Department of Transportation, Washington, DC 20590, identify itself as a tire manufacturer or retreader and furnish the following information:

(a) The name, or other designation identifying the applicant, and its main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., pneumatic tires for passenger cars, buses, trucks, or motorcycles; pneumatic retreaded tires; or non-pneumatic tires or non-pneumatic tire assemblies.

Issued on July 12, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 29581
July 20, 1990

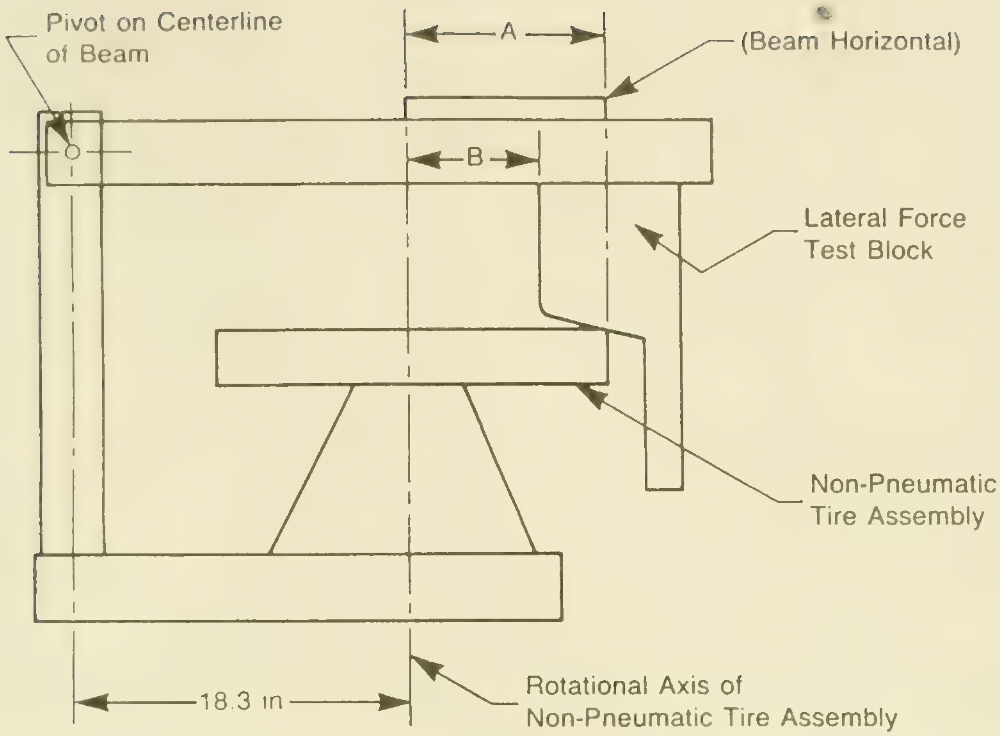

Figure 1. - Lateral Force Test Fixture (Dimension in Inches)

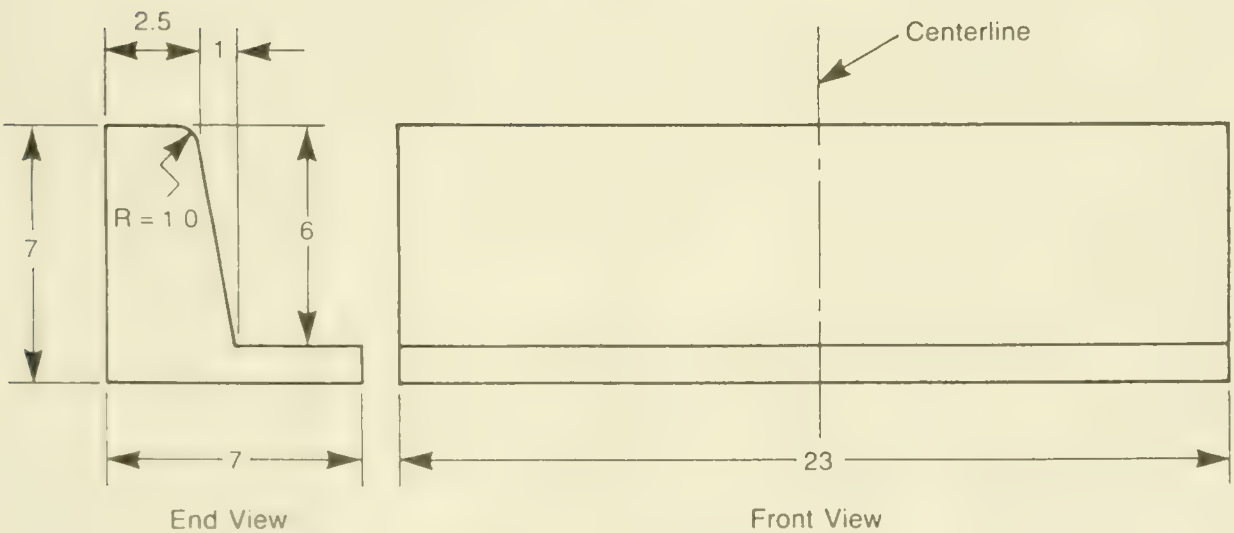

Figure 2. - Lateral Force Test Block (Dimension in Inches)
Dimensional Tolerance is ±0.050 in

PREAMBLE TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 129

New Non-Pneumatic Tires for Passenger Cars (Docket No. 87–12; Notice 3) RIN 2127–AC18

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 110, *Tire Selection and Rims*, and Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars*, to permit new passenger cars, multipurpose passenger vehicles, and light trucks equipped with passenger car tires to be equipped with a non-pneumatic spare tire. These standards had required all new vehicles to be equipped with pneumatic tires. The notice also establishes requirements requiring non-pneumatic tires to bear a label stating that the tires are to be used only as a temporary spare tire and only at limited speeds. It requires the manufacturer to place a placard in the vehicle and information in the owner's manual explaining the proper use of these tires. In addition, the notice establishes Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars*, which includes definitions relevant to non-pneumatic tires and specifies performance, testing, and additional labeling requirements for these tires. In particular, the new standard contains performance requirements related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. The agency has determined that these requirements provide the basic tests to ensure the structural integrity of non-pneumatic tires. To ensure an even higher degree of safety, a non-pneumatic tire must be labeled for use only as a temporary spare tire at limited speeds. NHTSA believes that these performance requirements together with these labels ensure the safety of non-pneumatic tires.

EFFECTIVE DATE: The rule is effective on August 20, 1990.

SUPPLEMENTARY INFORMATION:

I. *General Information*

Federal Motor Vehicle Safety Standard No. 110, *Tire Selection and Rims* (49 CFR §571.110), specifies requirements for the selection of tires to be used on passenger cars. Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars* (49 CFR §571.120), specifies similar requirements for the selection of tires to be used on vehicles other than passenger cars. The purpose of these standards is to prevent tire overloading and to facilitate the proper matching of a tire and rim to a vehicle. They also require a vehicle manufacturer to place in each new vehicle a placard bearing information to ensure use at the proper inflation.

Section S4.1 of Standard No. 110 requires passenger cars to be equipped with tires that meet the requirements of §571.109, "New Pneumatic Tires—Passenger Cars" (49 CFR §571.109). Section S5.1.1 of Standard No. 120 similarly requires vehicles other than passenger cars to be equipped with pneumatic tires that meet the requirements of Standard No. 109 or Standard No. 119 "New Pneumatic Tires for Vehicles Other Than Passenger Cars" (49 CFR §571.119).

Standard No. 109 expressly applies only to new pneumatic tires which it defines as "mechanical device(s) . . . (that) contain the *gas* or fluid that sustains the load" (emphasis added). The standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength (in vertical loading), tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

The practical effect of Standard No. 109's applicability to only pneumatic tires, together with Standard No. 110's requirement that passenger cars must be equipped with tires that meet Standard No. 109's requirements, is to prohibit any new passenger car from being equipped with non-pneumatic tires. Similarly, Standard Nos. 109, 119 and 120 together prohibit any vehicle subject to Standard No. 120 from being equipped with non-pneumatic tires.

A non-pneumatic tire is a mechanical device which serves the same function as a pneumatic tire. That is, it transmits the vertical load and tractive forces from the roadway to the vehicle and generates the tractive forces that provide the directional con-

trol of the vehicle. However, the non-pneumatic tire differs from the pneumatic tire in that the former does not rely on air pressure or the containment of any gas or fluid for providing those functions. A non-pneumatic tire may be designed in many different ways. For instance, it may be solid rubber to which tread is attached; it may be part of an assembly in which the wheel is attached to the tire and tread; or it may contain the tread, tire, rim, and wheel. Further, many different materials may be used in constructing the tire assembly. Because non-pneumatic tires present an emerging technology, it is likely that tire manufacturers may develop new designs and use materials that are currently not known or contemplated.

In view of Standard No. 109's and Standard No. 110's prohibition of tires other than pneumatic tires on motor vehicles, General Motors (GM) petitioned the agency to amend Standard No. 109 to allow non-pneumatic spare tire assemblies for temporary use on passenger cars. The petitioner suggested performance requirements and test conditions for non-pneumatic tires that would address characteristics such as the endurance, high speed performance, strength (in vertical loading), and lateral strength of the non-pneumatic tire. In large part, GM used the existing requirements in Standard No. 109 as a guide for selecting the performance requirements and test conditions for the requested amendment. It changed the requirement and test related to the bead unseating resistance, which specifically relates to pneumatic tires, and also changed the test procedure and strength requirements for the tire's ability to withstand concentrated vertical loads. In addition, GM suggested certain labeling requirements including a warning that the tires would be for temporary use.

GM submitted its petition in connection with its work with Uniroyal Goodrich Co. (Uniroyal) to develop a spare non-pneumatic tire which it intends for only temporary use. The petitioner believes that the agency's adoption of its requested amendment would reduce the weight and size of the spare tires used in passenger cars, resulting in reduced costs, improved reliability and servicability, and minor improvements in fuel economy. Because a non-pneumatic tire is not dependent on air pressure, it would not be subject to problems associated with low inflation pressure such as a blow out or bead unseating during hard cornering.

On September 23, 1987, NHTSA issued a notice announcing the grant of GM's petition and requesting comments about non-pneumatic tires (52 FR 35740). The notice invited comment about what requirements would be necessary to ensure the safe use of a non-pneumatic tire. In response to that notice, NHTSA received comments from various motor vehicle and tire manufacturers as well as the Rubber Manufacturers Association. NHTSA considered each of these comments in developing a notice of proposed rulemaking (NPRM) which it published on April 7, 1989 (54 FR 14109).

II. *Notice of Proposed Rulemaking*

In the NPRM, NHTSA proposed to amend Standard No. 110 to permit the use of non-pneumatic tires on passenger cars, but only as a temporary spare and to establish a new standard for non-pneumatic tires. The notice requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109. As a general proposition, the NPRM explained that in developing the new safety standard, the agency desired to formulate a generic one that would be applicable to as many potential designs of non-pneumatic tires as possible rather than one that was based on a specific design, which might inadvertently restrict future developments and skew innovations toward the initial design.

More specifically, the notice proposed three amendments to Standard No. 110. First, it proposed that section S4.1 be amended to allow passenger cars to be equipped with a non-pneumatic spare tire. Second, the notice proposed that Standard No. 110 contain additional labeling requirements and vehicle placarding requirements explaining that such tires should be used only as a spare tire on a temporary basis at speeds not to exceed 50 m.p.h. Third, the notice proposed that safety information about the use of a non-pneumatic tire be included in the owner's manual of the passenger car.

The proposed new safety standard was Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars.* According to the proposal, the new standard, which was patterned after Standard No. 109, would include definitions relevant to non-pneumatic tires and specify performance requirements, testing procedures, and labeling requirements for these tires. To regulate performance, the new standard would contain performance requirements and tests related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. While the agency considered proposing requirements related to additional factors such as handling and braking, it tentatively determined that the proposed requirements would adequately ensure motor vehicle safety by providing the basic tests necessary to ensure the structural integrity and durability of non-pneumatic tires.

The NPRM also proposed to supplement the labeling requirements in Standard No. 110 by including in Standard No. 129 labeling requirements similar

to those set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and the tire identification number. The notice proposed to allow methods of marking other than "molding," provided the marking was permanent because the agency tentatively concluded that it might be difficult to mold the required information on some types of anticipated non-pneumatic tire designs. The agency also tentatively concluded that the temporary use and maximum speed labeling requirements would provide an extra margin of safety related to handling and braking. In addition, the agency noted that compact pneumatic T-type tires that are currently used as temporary spare tires have been shown to be safe, even though they are not subject to performance requirements beyond those applicable to full size tires in Standard No. 109. The agency believed that in some respects this comparison was relevant since, like the compact T-type pneumatic tires, the non-pneumatic tires allowed by these amendments would be limited to use as temporary spare tires.

The agency tentatively concluded that the proposed performance requirements, together with the proposed labeling requirements, would remove a restriction in the existing standards on technological innovation while still ensuring that the new non-pneumatic tires met the need for safety.

III. *The Comments and the Agency Response*

NHTSA received 13 comments in response to the NPRM. In general, all commenters supported the proposal to permit a vehicle to be equipped with a non-pneumatic spare tire. The agency has considered the points in the comments in developing this final rule. The commenters' significant points are addressed below, along with the agency's response to the comments. For the convenience of the reader, this notice follows the regulatory text's order.

A. *Proposal to Amend Standard No. 110*

Definitions

The NPRM proposed to add definitions to paragraph S3 for "non-pneumatic spare tire assembly," "non-pneumatic tire," "non-pneumatic tire assembly," "rim," and "wheel center member." The agency intended these definitions to be general in order to better ensure a generic standard appropriate to any type of non-pneumatic tire. These definitions were patterned after analogous definitions in NHTSA's safety standard for pneumatic tires and SAE Recommended Practice J328a, "Wheels—Passenger Cars—Performance Requirements and Test Procedures."

The agency received two comments about the proposed definitions. Michelin requested that the definition of a "non-pneumatic spare tire assembly", which was defined as a device "intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car . . .", be revised to state that the NPSTA be "in support of" as well as "in place of." According to the commenter, this modification would allow future NPSTAs to be fitted on tire and wheel assemblies without removing the deflated pneumatic tire. The agency has decided not to adopt Michelin's suggestion which is beyond the scope of the current proposal and its test procedures. Further, the agency needs more information about devices used "in support of" a deflated pneumatic tire, especially about the procedures for testing them while they are mounted on a deflated pneumatic tire. Therefore, NHTSA has decided not to expand the definition as requested by Michelin.

Uniroyal suggested that the agency move the definition of "rim" from the definition section (S3) to the requirements section (S4.4). The agency has decided not to adopt this suggestion which is unnecessary and contrary to standard regulatory drafting. The agency notes that it is modifying the definition of "rim" to "non-pneumatic rim" and "test rim" to "non-pneumatic test rim." This change will help to distinguish between conventional rims for pneumatic tires and rims for non-pneumatic tires. The notice adopts this distinction throughout Standards 110, 120, and 129.

Labeling Requirements

The NPRM proposed labeling requirements for non-pneumatic spare tires and tire assemblies in section S6 of Standard No. 110. The proposal specified that the information had to be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" and not be smaller than a given size. The proposal explained that it was proposing to allow different methods of permanent marking in addition to molding, the labeling method required in Standard No. 109, because it might be difficult to mold the required information into or onto some non-pneumatic tire and assembly designs. It also proposed that the labeling on each non-pneumatic spare tire would state "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation(s) of the pneumatic tire(s) that the non-pneumatic tire was intended to replace. This notice will respond separately to each of the commenters concerns.

Uniroyal requested the agency to modify the requirement that non-pneumatic spare tires be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" to allow a permanently affixed label to contain the required information. It specifically stated that paper or plastic labels should be allowed as an alternative

technique to comply with S6. NHTSA notes that the key criteria related to informational marking requirements is that the message be useful and understandable for the lifetime of the tire. Thus, a message must be permanent, legible, and conspicuous. After reviewing Uniroyal's request, the agency believes that affixing a permanent label on a non-pneumatic tire would not meet these ends. The agency is concerned that a paper label would not be permanent given that it would be exposed to environmental factors such as rain, snow, road salt, car wash brushes and detergents. The agency is especially concerned that there is nothing to prevent a paper label from disintegrating when exposed to the elements or being rubbed off by a curb. Similarly, there is nothing to prevent the printing on the label from becoming illegible. The agency therefore has decided not to permit a label as an alternative technique to comply with S6.

Section S6(a) contained a proposal that each non-pneumatic spare tire be labeled "FOR TEMPORARY USE ONLY." The NPRM explained that this mandatory warning would be in the interest of motor vehicle safety by encouraging the limited use of non-pneumatic tires as a replacement for T-type temporary spare tires. The agency further believed such labeling would provide consumers with valuable guidance about this new type of tire. All commenters mentioning the proposal to require temporary use labeling agreed that it had merit given the current level of technology and agreed that the extended use of a non-pneumatic tire would be inappropriate.

Section S6(b) contained a proposal that each non-pneumatic spare tire be labeled "MAXIMUM 50 M.P.H." The NPRM stated that this maximum speed warning, like the temporary use warning, would be in the interest of safety. The notice further explained that the Economic Commission for Europe (ECE) Regulation 64 contains a maximum speed warning of 80 kilometers per hour (49.7 m.p.h.) in response to concerns over the potential for some degradations in the braking and handling performance of a vehicle fitted with a temporary spare tire. The notice continued that even though these concerns did not directly relate to a tire's structural failure, the agency believed that a maximum speed warning would improve the total safety of the vehicle because any potential problems associated with handling, control, stability, and braking are typically exacerbated at faster speeds. It also stated that a maximum speed warning would serve to deter some motorists from driving with a non-pneumatic tire on an extended basis.

NHTSA received four comments on the proposal to require a maximum speed warning of 50 m.p.h. While Goodyear and Firestone supported the proposal, Uniroyal and General Motors opposed it, stating that it should be at the discretion of the vehicle manufacturer, the entity responsible for the vehicle's braking, handling, and other performance characteristics. Uniroyal stated that such a requirement is unnecessary since T-type pneumatic spares are not required to have such labeling. It also commented that the maximum speed labeling in ECE Regulation 64 is inapplicable to the non-pneumatic spare, since the non-pneumatic tire would be subject to more stringent performance requirements. GM commented that a maximum speed labeling requirement was not warranted, stating that "there is no generic technical or safety reason for it," a non-pneumatic spare tire is not different from current temporary compact spare tires, the maximum recommended speed of 50 m.p.h. might unduly alarm some drivers, and consumers might misinterpret the "50 *m.p.h.* speed" label as a "50 *mile* use" restriction.

After reviewing the maximum speed labeling requirement in light of these comments, NHTSA continues to believe that such a requirement would be in the interest of safety. The agency notes that according to information provided by Uniroyal, there are some differences in performance characteristics between non-pneumatic spare tires and pneumatic spares. For instance, the non-pneumatic tire tends to "nibble," i.e., generate lateral forces when crossing a longitudinal road irregularity. While differences with conventional pneumatic spare tires are not significant enough to justify a prohibition of non-pneumatic tires, these relative shortcomings, which might alarm a driver unfamiliar with them, appear to be exacerbated at greater speeds. Until more experience is gained with non-pneumatic tires, the agency believes that GM's claim that there is no safety reason to justify maximum speed labeling is premature. The agency notes that GM included a 50 m.p.h. maximum speed marking on its pneumatic temporary spare tire for the first five years after its introduction, suggesting that a newly introduced temporary tire design should contain such a maximum speed warning. Based on the above considerations, the agency concludes that to satisfy the Vehicle Safety Act's mandate, the 50 m.p.h. maximum speed marking must be a mandatory requirement and not be left to the manufacturers' discretion.

Section S6(c) of Standard No. 110 contained a proposal that the non-pneumatic tire be labeled with the "size designation(s) of the pneumatic tires that this non-pneumatic tire spare assembly is intended to replace or, at the manufacturer's option, is capable of replacing." All those who commented on this provision opposed it, stating that the requirement could result in lengthy information that might confuse consumers. For instance, a consumer might mistakenly conclude that a 15 inch non-pneumatic

tire could replace any 15 inch pneumatic tire. They claimed that this incorrect assumption could be dangerous given the potential for many vehicle specific non-pneumatic tire and tire assembly designs. In place of this proposal, Uniroyal, Firestone, and GM suggested that the tires be labeled with a vehicle manufacturer's part number, with GM recommending a "non-pneumatic spare tire identifying code" (e.g., "ABC") as an alternative. The State of Connecticut recommended that the non-pneumatic spare tire be labeled to indicate specifically the vehicle(s) on which it is intended to be used. In contrast, Goodyear and Uniroyal criticized requiring vehicle specific marking, stating that the labeling on a tire with multiple vehicle applications could be lengthy, confusing, and thus possibly dangerous.

After reviewing these comments, NHTSA has determined that instead of designations of the pneumatic tires replaced, a "non-pneumatic tire identifying code (NPTIC)" should be required to identify a non-pneumatic tire. Like the tire size designation of a pneumatic tire, the NPTIC's purpose is to provide consumers information about the proper application of a non-pneumatic tire. The agency believes that this method of identification is superior to requiring a non-pneumatic tire to be labeled with the pneumatic tire size or the non-pneumatic spare tire's specific vehicle application(s) given the potential for many different non-pneumatic tire designs. A manufacturer may still mark specific vehicle application(s) on the tire provided that the additional information did not obscure or confuse the required information. Manufacturers are urged, therefore, to avoid unnecessarily long vehicle application information or unnecessarily long identifying codes. Based on the above considerations, the manufacturer will be required to label a non-pneumatic spare tire or spare tire assembly with a "non-pneumatic tire identification code," (NPTIC), which is defined in section S3 of Standard 129. A manufacturer also is required to place the NPTIC on the vehicle placard and in the owner's manual. In addition, the NPTIC will replace any reference in the regulatory text to the "non-pneumatic tire size designation."

Vehicle Placarding

Section S7 of the Standard No. 110 contained proposed requirements for vehicle placards. Under the proposal, the placard would state, in letters not less than 1.0 inch high, "CAUTION—USE AS SPARE TIRE," and in letters not less than 0.5 inches high, "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation of the pneumatic tire to be replaced. The agency believed that this information would help explain that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time.

Volkswagen commented that the size of the lettering proposed in S7.1 would result in a placard that was too large to easily fit in the trunk. Thus, it requested that the standard require the words to be "legible and conspicuous," or in the alternative, to change the 1.0 inch requirement to ⅜ inch and the ½ inch requirement to ¼ inch. NHTSA rejects the first suggestion because the Vehicle Safety Act requires its requirements to be stated in objective terms. However, it has decided to adopt the requested size reductions which the agency believes will be less intrusive but still conspicuous.

GM and Uniroyal opposed the vehicle placarding requirements as being unnecessary and costly. GM based its opposition to these requirements on its earlier arguments against the labeling requirements. NHTSA believes that the placarding requirements are necessary for the reasons provided in support of the labeling requirements in S6. The agency also disagrees that placarding would be unreasonably costly, especially since most vehicle trunks currently contain a placard explaining the use of jacks and spare tires. The information required by this provision could be easily added to that placard. Even for a vehicle without such a placard, the cost of adding a placard would be minimal.

Uniroyal claimed that the words "Danger" and "Caution" might unduly alarm consumers. NHTSA notes that the placard's purpose is to ensure that a person installing a non-pneumatic spare tire on a vehicle is made aware of its proper use and that it should be used only as a spare tire, even if he or she fails to notice the labeling on the tire itself. Because the word "caution" is not essential to this purpose and some consumers might be unduly alarmed by this word, the agency is modifying the placard to state "IMPORTANT—USE OF SPARE TIRE" rather than "CAUTION—USE OF SPARE TIRE."

Supplementary Information

Section S7.2 of Standard No. 110 proposed that the owner's manual of a passenger car equipped with a non-pneumatic spare tire contain information explaining its proper use. This information, which was patterned after ECE Regulation 64, included instructions that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time, that the driver should drive with caution when using a non-pneumatic tire, that he or she should replace it with a pneumatic tire and rim as soon as possible, and that a vehicle should not be operated with more than one non-pneumatic tire at one time.

Uniroyal and GM objected to the proposal to require an owner's manual to contain information

about a non-pneumatic tire's use. Uniroyal restated its view that non-pneumatic tires should not be singled out for informational requirements with which pneumatic spare tires are not required to comply. GM stated that requiring warnings on the tire, on a placard, and in the owner's manual was a "costly redundancy" that would discourage the use of such tires.

NHTSA continues to believe that the requirements in S7.2 provide valuable safety information about non-pneumatic tires, a new type of tire design with which consumers will be less familiar than temporary pneumatic tires. As for GM's criticism that this requirement would result in a "costly redundancy," the agency believes that requiring the safety information to appear in each of the proposed locations provides a safety benefit. It is reasonable to label the tire since a motorist must handle the tire itself before installing it on the vehicle. It is also reasonable to require the information on a placard in the trunk near where the spare tire is stored, because a motorist may not notice the information on the tire, especially at night or during inclement weather. Similarly, it is reasonable to supplement these brief messages with more detailed information in the owner's manual, since a motorist typically consults his or her owner's manual when seeking detailed information about vehicle usage.

In response to GM's concern that these warnings might discourage motorists from using non-pneumatic tires, the agency has modified some of the wording. As with the placard's wording, the agency has substituted the word "IMPORTANT" for "CAUTION" to make the label less threatening. It has also changed S7.2(b) to state "An instruction to drive carefully when the non-pneumatic tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity." The agency believes that this wording will continue to convey guidance concerning the proper use of non-pneumatic tires while helping to avoid arousing "undue concern."

B. *Standard No. 129*

Application

The agency proposed in section S2 of Standard No. 129 that the new standard apply to "new temporary spare non-pneumatic tires for use on passenger cars." In other words, the proposal, in conjunction with the proposed amendment to Standard No. 110, would permit a non-pneumatic tire to be used as a spare tire on passenger cars. The NPRM explained that the petitioner only sought to allow non-pneumatic tires as a replacement for T-type pneumatic temporary tires on passenger cars. It further noted that 95 percent of T-type tires were used on passenger cars with the remaining 5 percent on light trucks. The agency requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109.

No commenter supported limiting the use of non-pneumatic tires to passenger cars. Instead, Chrysler, Goodyear, Uniroyal, RMA, Firestone, and GM commented that the agency should extend the applicability of Standard No. 129 to permit use of non-pneumatic spare tires on light trucks and similar vehicles that use passenger car temporary tires. For instance, Uniroyal stated that the agency should not restrict the non-pneumatic spare tire to passenger cars given that many new light trucks and vans are equipped with passenger car tires.

NHTSA agrees with the comments and has decided to permit the use of a non-pneumatic spare tire on any vehicle that is equipped with passenger car tires. Accordingly, the agency is revising section S5.1.1 to permit the use of a non-pneumatic temporary spare tire assembly on vehicles subject to Standard No. 120 such as light trucks provided that the vehicle is equipped with passenger car tires. In addition, amendments, like those to Standard No. 110, are made to Standard No. 120 to include new informational requirements for tire labeling, vehicle placarding, and the owner's manual.

Definitions

Commenters made suggestions to modify certain proposed definitions. Firestone recommended that the portion of the definition for "non-pneumatic tire" stating that the tire "does not rely on the containment of any gas or fluid" be changed to state that the tire "does not *primarily*" rely on such containment (emphasis added). NHTSA has decided to reject Firestone's suggestion and adopt the definition as proposed because the suggested change would inject uncertainty about whether a tire should be classified as pneumatic or non-pneumatic. For instance, it might be ambiguous whether a pneumatic tire with "run-flat" capability is a non-pneumatic tire under Firestone's suggested definition.

Goodyear, Uniroyal, and RMA suggested that the definition for "tread" be changed by deleting reference to the tread's being "intended to wear away during normal use of the tire." NHTSA agrees with this suggestion which will make the definition for "tread" in Standard No. 129 consistent with the one in Standard No. 109.

Uniroyal suggested that the definition for "maximum tire width," should be changed so that it uses the phrase "exterior edges" in place of "outer and inner surfaces" which appears in reference to

"carcass" and "tread." The agency has decided to adopt the suggested wording which it believes provides a more generic and thus more appropriate definition.

The agency is introducing a definition for "Non-pneumatic tire identification code" (i.e., "NPTIC") in response to comments that a non-pneumatic tire should not be labeled with the size of the pneumatic tire it is intended to replace, but should be labeled with other identifying information. In the section above about labeling requirements, the notice explains that the agency agrees with the commenters that the NPTIC would be in the interests of safety. The reader should refer to that section for a more extensive discussion of this issue.

As discussed earlier, the terms "rim" and "test rim" have been changed to "non-pneumatic rim" and "non-pneumatic test rim." This will help distinguish between rims used with pneumatic tires and those used with non-pneumatic tires. Corresponding changes have been made throughout the regulatory text.

Performance Requirements and Testing Procedures in Standard No. 129

General Considerations

The NPRM proposed certain performance requirements and testing procedures for non-pneumatic tires. In developing a proposed standard for non-pneumatic tires, the agency reviewed the petition, the docket comments responding to the agency's request for comments, and the purpose for and mechanics of the requirements and tests for pneumatic tires in Standard No. 109. As a result of this analysis, the agency proposed the following requirements which it believed would ensure the safety of non-pneumatic tires. These included a lateral strength requirement instead of Standard No. 109's bead unseating requirement; and requirements for strength (in vertical loading), tire endurance, and high speed performance with modifications to take into account a non-pneumatic tire's lack of air pressure. The agency also proposed requirements related to the non-pneumatic tire assembly's size and construction, load rating, and a tread wear indicator. NHTSA tentatively concluded that the lateral strength, strength (in vertical loading), endurance, and high speed requirements would assure the structural integrity and durability of a non-pneumatic tire. The agency further believed that these performance requirements together with the proposed labeling requirements explaining that a non-pneumatic tire should be used only as a temporary spare tire and at limited speeds would assure their safety. Therefore, it decided not to propose additional tests beyond those equivalent to the ones in Standard No. 109. The agency's consideration of comments addressing these factors will be discussed separately.

Lateral Strength Performance Requirements

Section S4.2.2.3 of Standard No. 129 proposed requirements related to the lateral strength of a non-pneumatic tire. Such a tire would be required to show no visual evidence of tread or carcass separation, cracking, or chunking at forces comparable to those specified in Standard No. 109's bead unseating test for compact temporary pneumatic tires. The agency explained that the bead unseating test is intended, in part, to evaluate the loss of air of a tubeless pneumatic tire. In that regard, it would not be helpful in evaluating the lateral strength of a non-pneumatic tire. Nevertheless, because the bead unseating test also evaluates a pneumatic tire's resistance to lateral forces, the agency believed that a comparable test for non-pneumatic tires would be beneficial in determining their structural integrity.

The NPRM explained that GM, in its petition, recommended adopting the same test device used in the bead unseating test of pneumatic tires in Standard No. 109. The agency rejected this recommended test fixture because the unseating "blocks" might be inappropriate for other non-pneumatic tire designs and thus would be too specific to be included in a generic standard. Instead, the agency proposed a lateral strength test device that it believed was generic and appropriate for any anticipated non-pneumatic tire design. The proposed test block was patterned after a standard barrier type curb defined by the American Association of State Highway and Transportation Officials (AASHTO) in its publication, "A Policy on Geometric Design of Highways and Streets—1984." The proposed test was intended to evaluate the strength of a non-pneumatic tire in response to loads that would result from contact with a curb or similar road feature. The agency sought comments concerning the design of the proposed test device, test procedure, and performance requirements intended to evaluate the lateral strength of non-pneumatic tires.

Goodyear requested that the non-pneumatic tires not be subject to a lateral strength test, claiming that such a test was unnecessary and inappropriate. It also claimed that the intent of Standard No. 109's bead unseating test is solely "air retention," as evidenced by its application to tubeless but not tubed pneumatic tires.

NHTSA disagrees with Goodyear's comments and believes that the lateral strength requirement will effectively measure a non-pneumatic tire's resistance to lateral loads. The agency believes that this test will also help evaluate the possibility of the tire's separation from the rim or wheel center mem-

ber or the tire's "cracking," "chunking," or similar damage. The agency notes that the reason that Standard No. 109's bead unseating test is applied to tubeless tires only is because that failure mode is unique to tubeless pneumatic tires. Thus, its application to tubed pneumatic tires would be unnecessary and inappropriate.

Uniroyal, RMA, and Firestone each recommended that the lateral test force block be made lighter and smaller to make testing easier and safer. The lateral force test block shown in Figure 2 and referenced in S5.2, would have weighed 120 pounds and have been 6.5 inches in height, 14 inches in depth and 18 inches in width. Uniroyal commented that the block's depth could be reduced by 7 inches which would reduce the block's weight by over 50 percent. Firestone stated that the width should be retained to ensure that the test block would envelop the side wall of each tire.

After reviewing these comments, NHTSA believes that the test block size can be reduced to facilitate testing without adversely affecting the test procedure's effectiveness. In particular, the agency is adopting Uniroyal's recommendation to reduce the depth by 7 inches by removing 3½ inches from each end of the block and to reduce the height by removing one inch from the bottom of the block. After reviewing Firestone's concerns about the block's "envelopment" of a non-pneumatic spare tire, the agency concludes that it is necessary to widen the test block to 23 inches. The agency calculates that these changes will reduce the test block's weight to approximately 55 pounds, a 53 percent reduction.

Section S5.2 of the NPRM also proposed test requirements related to a non-pneumatic tire's lateral strength. Section S5.2.2.1 specified distances between the test block and the tire being tested. Uniroyal recommended that the agency add another distance expressed as "B = A − 1," explaining that without this modification certain tires would not pass the proposed requirement due to immediate contact with the wheel rim or other member. Thus, in anticipation of future non-pneumatic tire designs with a section height of less than 2 inches above the wheel rim or center member, the agency is including the additional distance requested by Uniroyal.

Vertical Strength Requirements

NHTSA proposed a strength test in S5.3 of Standard No. 129 that was intended to measure the tire's ability to resist concentrated vertical loads. The proposed test would have required a cylindrical steel plunger to be forced into the non-pneumatic tire at a rate of two inches per minute. The tester would then have evaluated the breaking energy for each test point in terms of inch pounds.

In the NPRM, the agency considered also proposing a "cleat" test, like the one suggested in GM's petition, which would have required a non-pneumatic tire to withstand a load exerted by a "cleat." This "cleat" would be ½ inch thick with the edge, that is forced against the tread of the non-pneumatic tire, rounded with ¼ inch radius, and the "cleat" would be one inch wider than the non-pneumatic tire's tread width. The agency tentatively rejected the cleat device because it believed that the plunger test would better simulate real world hazards and because the petitioner did not provide sufficient documentation in support of its test device. The agency expressly requested comments on both the plunger test and the cleat test.

Goodyear provided extensive comments in opposition to any vertical strength test requirement. It argued that the main concern addressed by the "tire strength" requirement in Standard No. 109 is puncture resistance (i.e., the integrity of the air chamber in resistance to vertical forces exerted by nails and similar penetrating objects). It believed that such a concern was not applicable to a non-pneumatic tire. Alternatively, Goodyear stated that if a strength test were deemed necessary, then GM's cleat test would be more appropriate because it evaluates a non-pneumatic tire's capability to withstand loading from curbs, potholes, or railroad tracks. While Uniroyal, RMA, Firestone, and GM also stated that the cleat test would be superior to a plunger test, no commenter supported the plunger test.

NHTSA continues to believe that a vertical strength test is necessary to evaluate a non-pneumatic tire's structural integrity. However, after reevaluating the proposal in light of the comments, the agency agrees that a cleat test, similar to the one requested in GM's petition, would better evaluate the real world problems that will most likely cause a non-pneumatic tire to experience a structural failure.

The agency notes that the plunger test used in Standard No. 109 is well suited for evaluating the energy absorbing capability and structural integrity of a pneumatic tire under conditions of maximum deformation. The plunger pushing against the center of the pneumatic tire's tread will deflect the tire to the maximum extent possible before forcing the tire against the rim. However, the cleat test would be inapplicable for a pneumatic tire which would experience a "pneumatic" failure when the tire's sidewall would be pinched against the rim flanges, long before the energy absorbing capability or structural integrity of the tire could be tested adequately.

In contrast, the situation is reversed for non-pneumatic tires. The "concentrated" type of load used in the plunger test could lead to a "puncture" (i.e., penetration by the plunger) of a non-pneumatic tire, but would not lead to a "pneumatic" failure. For

instance, Uniroyal, stated that its non-pneumatic tire continued to perform without any problems after it was "punctured" by several nails. The agency further notes that there is nothing inherent in a non-pneumatic tire's design that would be expected to lead to failure as the result of a particular type of impact. Based on these considerations, the agency believes that a cleat test that places stress on the entire cross section of a non-pneumatic tire appears to better address real world hazards to which such tires would be vulnerable than would a plunger type test.

As for the measurement of a non-pneumatic tire's strength, NHTSA believes that such a tire should be capable of absorbing energy at a level comparable to the pneumatic temporary tires that it is intended to replace. The NPRM proposed in S4.2.2.4 that the appropriate minimum breaking energy would be 1,950 inch pounds for tires with load ratings below 880 pounds and 2,600 inch pounds for tires with load ratings 880 pounds or above.

Uniroyal recommended that S4.2.2.4 be amended so that the minimum breaking energy would be 525 inch pounds for tires with load ratings below 880 pounds and 700 inch pounds for load ratings of 880 pounds or above. After reviewing Uniroyal's extensive comments in support of the reduced energy levels, NHTSA still believes that the proposed levels are appropriate to ensure a non-pneumatic tire's ability to withstand road hazards. The agency notes that the proposed energy levels are more comparable to the energy levels that a pneumatic temporary spare tire is required to withstand. Given the agency's belief that it is appropriate to require the non-pneumatic tires to be capable of absorbing energy at a level comparable to the pneumatic temporary spare tires that they are intended to replace, the agency has decided to adopt the energy levels as proposed rather than to adopt Uniroyal's suggested energy levels. The agency's review of Uniroyal's data further indicates that the higher energy levels will better protect against real world hazards.

After reviewing S4.2.2.4, NHTSA has decided to modify its language related to a non-pneumatic tire's failure. As proposed, this section stated "Each tire shall meet the requirements for minimum breaking energy when tested in accordance with S5.3 to the strength requirements . . . ." Because a non-pneumatic tire is unlikely to "break," the agency has decided to adopt the statement in the petition and express the requirement in terms of "no visual evidence of tread or carcass separation, cracking or chunking." The agency notes that this will be consistent with the requirements for lateral strength, tire endurance, and high speed performance, which are all expressed in this manner. As a result, the title of the table "Breaking Energy" will be changed to "Minimum Energy Level."

Other Performance Requirements

The NPRM proposed requirements for tire endurance in section S4.2.2.5 and high speed performance in Section S4.2.2.6. The proposals, which were patterned after the requirements in Standard No. 109, were intended to determine the structural integrity and durability of the tire under accelerated laboratory conditions. The agency received no comments about these tests and has decided to adopt them as proposed.

In the NPRM, the agency decided not to propose additional performance requirements explaining its tentative conclusion that the proposed requirements together with the labeling requirements would be adequate to ensure motor vehicle safety. In response to the 1987 request for comments, commenters who expressed an opinion on the matter all stated that no additional performance requirements were necessary. Similarly, in response to the NPRM, no commenter recommended requiring additional performance requirements. After reviewing the matter, the agency is reaffirming its tentative conclusion that the performance requirements, as proposed, together with the labeling requirements, will ensure safety and thus is not requiring any additional performance requirements.

Labeling Requirements in Standard 129

As explained earlier in this notice, the agency is adopting new labeling requirements in S6 of Standard No. 110 and S8 of Standard No. 120. The reader should refer to the discussions in earlier sections of this notice about such issues as a label's permanency, information to be provided about the tire's temporary use and maximum speed, and the tire size labeling/non-pneumatic tire identification code.

In addition to those requirements, the NPRM proposed certain other labeling requirements for non-pneumatic tires. Most of these proposed requirements were patterned after the labeling requirements set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and tire identification number.

GM requested that a load rating not be required on a non-pneumatic tire, claiming this information might cause a motorist to use a non-pneumatic spare tire that would be inappropriate for a vehicle. The agency disagrees with the comment, noting that a tire's load rating is a straightforward item of information that has been required on pneumatic tires without confusing consumers. The agency believes this information is necessary for safety because some vehicle owners have been known to increase a

vehicle's load capacity by the addition of "helper springs" or "air shocks" to permit the towing of a trailer. Thus, by not requiring load rating information, the agency would increase the potential for a motorist to unknowingly use a vehicle equipped with the non-pneumatic tire in an unsafe manner.

Uniroyal commented that S4.3(f), which proposed requiring labeling with Part 574's tire identification number, should be amended given that that number refers, in part, to tire size. As the agency noted above in its discussion of tire size designations and the NPTIC, it believes that use of the NPTIC is preferable to use of tire size. While the agency agrees that a change is therefore necessary to reflect the NPTIC, it has decided to accomplish this by amending Part 574 to apply to non-pneumatic spare tire assemblies and by amending 574.5(b) to expressly refer to the NPTIC. Section 574.4, "applicability," and 574.6, "identification mark," are also revised to expressly refer to non-pneumatic tires and tire assemblies.

Tire and Rim/Wheel Center Member Matching Information

Section S4.4 proposed that each manufacturer list information about the rim or wheel center member expected to be used with a non-pneumatic tire. The information would be provided to either NHTSA or a tire and rim standardization organization such as The Tire and Rim Association. The proposal, which was patterned after section S4.4 of Standard No. 109 for pneumatic tires, is intended to ensure the dissemination of information about the proper use of non-pneumatic tires with rims.

Uniroyal recommended changing the first sentence of S4.4 to exempt from the section's requirements, a non-pneumatic spare tire that is an integral part of a non-pneumatic spare tire assembly. The agency agrees that such an exemption is appropriate given that the section's purpose is to provide information about the matching of non-integral tires and rims.

GM suggested adding a provision which would allow the required information to be disseminated by inclusion in the "vehicle manufacturer's service parts publications for the vehicle on which it is to be used." The commenter believed this change would help prevent the agency and manufacturers from being "deluged" with descriptions of non-pneumatic rims and wheel center members. Based on its experience with pneumatic tires, NHTSA has decided to reject GM's suggestion because the proposed requirement, i.e., the submission of this information to the agency or through the industry's standardization organizations, will be a more effective way to disseminate this information.

After reviewing this provision, NHTSA has decided to modify S4.4. to require the submission to include the NPTIC. This modification to require the inclusion of the NPTIC rather than the tire size is a conforming change made to reflect another change addressed earlier in the notice. In addition, the agency notes that it proposed in the definition of "test rim" in S3 to require each tire and rim matching information listing to include the load rating. After further review, the agency has determined that it more appropriate to include this requirement in section S4.4.

IV. *Effective Date*

The NPRM stated that the proposal would become effective 180 days after publication of a final rule in the *Federal Register*. Uniroyal commented that such advance notification is associated with revisions of regulations that affect products already in the marketplace to afford manufacturers time to comply with the changes. Uniroyal then requested that the 180 day period be eliminated or substantially reduced.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. After reviewing the request, NHTSA agrees that there is "good cause" not to require the full 180 day leadin period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers and that the public interest will be served by not delaying the introduction of these alternative tire designs. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, the agency is amending Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars,* and is establishing Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* in Title 49 of the Code of Federal Regulations at Part 571 as follows:

§571.110 [Amended]

1. Paragraph S2 of Standard 110 is revised to read as follows:

S2 *Application.* This standard applies to passenger cars and to non-pneumatic spare tire assemblies for use on passenger cars.

2. Paragraph S3 of Standard No. 110 is amended by adding the following definitions in the proper alphabetical location:

"Non-pneumatic rim" is used as defined in §571.129.

"Non-pneumatic spare tire assembly" means a

non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

"Non-pneumatic tire" and "non-pneumatic tire assembly" are used as defined in §571.129.

"Rim" is used as defined in §571.109.

"Wheel center member" is used as defined in §571.129.

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3. Paragraph S4.1 of Standard No. 110 is revised to read as follows:

S4.1 *General.* Passenger cars shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* except that passenger cars may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars* and S6 and S8 of this standard. Passenger cars equipped with such an assembly shall meet the requirements of S4.3(e), S5, and S7 of this standard.

* * * * *

4. Paragraph S4.3(c), (d), and (e) is revised to read as follows:

* * * * *

(c) Vehicle manufacturer's recommended cold tire inflation pressure for maximum loaded vehicle weight and, subject to the limitations of S4.3.1, for any other manufacturer-specified vehicle loading condition;

(d) Vehicle manufacturer's recommended tire size designation; and

(e) For a vehicle equipped with a non-pneumatic spare tire assembly, the non-pneumatic tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of §571.129, *New Non-Pneumatic Tires for Passenger Cars.*

* * * * *

5. Standard No. 110 is amended by adding paragraphs S5, S6, S7 and S8 to read as follows:

S5 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S6 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.*

Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S7 *Requirements for Passenger Cars Equipped with Non-Pneumatic Spare Tire Assemblies.*

S7.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the vehicle trunk lid or an equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S6 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S7.2 *Supplementary Information.* The owner's manual of the passenger car shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S6(a) and (b) and in S4.3(e);

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the passenger car is not recommended with more than one non-pneumatic spare tire in use at the same time.

S8 *Non-Pneumatic Rims and Wheel Center Members*

S8.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

S8.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

§571.120 [Amended]

6. Paragraph S3 of Standard 120 is revised to read as follows:

S3 *Application.* This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles.

* * * * *

7. Paragraph S5.1.1 of Standard No. 120 is revised to read as follows:

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* or §571.119, *New Pneumatic Tires for Vehicles Other than Passenger Cars,* and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 with §571.109, or S5.1 of §571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars,* and S8 and S10 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.6, S7, and S9 of this standard.

8. The introductory text of paragraph S5.3.2 of Standard No. 120 is revised to read as follows:

S5.3.2 *Vehicles Manufactured on or after December 1, 1984.* Each vehicle manufactured on or after December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5, and in the case of a vehicle equipped with a non-pneumatic spare tire, also that specified in S5.3.6, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

* * * * *

9. Paragraph S5.3.6 is added to Standard No. 120 to read as follows:

S5.3.6 The non-pneumatic tire identification code, with which that assembly is labeled pursuant to S4.3(a) of §571.129.

10. Standard 120 is amended by adding paragraphs S7, S8, S9, and S10.

S7 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S8 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S9 *Requirements for Vehicles Equipped with Non-Pneumatic Spare Tire Assemblies*

S9.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the spare tire stowage area or equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S8 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S9.2 *Supplementary Information.* The owner's manual of the vehicle shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S8(a) and (b) and in S5.3.6;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the vehicle is not recommended with more than one non-pneumatic spare tire in use at the same time.

S10 *Non-Pneumatic Rims and Wheel Center Members*

S10.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

S10.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

11. Part 571 is amended by the addition of 49 CFR §571.129 which would read as follows:

§571.129 Standard No. 129; *New Non-Pneumatic Tires for Passenger Cars.*

S1 *Scope.* This standard specifies tire dimensions and laboratory test requirements for lateral strength, strength, endurance, and high speed performance; defines the tire load rating; and specifies labeling requirements for non-pneumatic spare tires.

S2 *Application.* This standard applies to new temporary spare non-pneumatic tires for use on passenger cars.

S3 *Definitions.*

"Carcass" means the tire structure except for the tread which provides the major portion of the tire's capability to deflect in response to the vertical loads and tractive forces that the tire transmits from the roadway to the non-pneumatic rim, the wheel center member, or the vehicle and which attaches to the vehicle or attaches, either integrally or separably, to the wheel center member or non-pneumatic rim.

"Carcass separation" means the pulling away of the carcass from the non-pneumatic rim or wheel center member.

"Chunking" means the breaking away of pieces of the carcass or tread.

"Cracking" means any parting within the carcass, tread, or any components that connect the tire to the non-pneumatic rim or wheel center member and, if the non-pneumatic tire is integral with the non-pneumatic rim or wheel center member, any parting within the non-pneumatic rim, or wheel center member.

"Load rating" means the maximum load a tire is rated to carry.

"Maximum tire width" means the greater of either the linear distance between the exterior edges of the carcass or the linear distance between the exterior edges of the tread, both being measured parallel to the rolling axis of the tire.

"Non-pneumatic rim" means a mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

"Non-pneumatic test rim" means, with reference to a tire to be tested, any non-pneumatic rim that is listed as appropriate for use with that tire in accordance with S4.4.

"Non-pneumatic tire" means a mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle, and does not rely on the containment of any gas or fluid for providing those functions.

"Non-pneumatic tire assembly" means a non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

"Non-pneumatic tire identification code" means an alphanumeric code that is assigned by the manufacturer to identify the tire with regard to its size, application to a specific non-pneumatic rim or wheel center member, or application to a specific vehicle.

"Test wheel center member" means, with reference to a tire to be tested, any wheel center member that is listed as appropriate for use with that tire in accordance with S4.4.

"Tread" means that portion of the tire that comes in contact with the road.

"Tread separation" means the pulling away of the tread from the carcass.

"Wheel" means a mechanical device which consists of a non-pneumatic rim and wheel center member and which, in the case of a non-pneumatic tire assembly incorporating a wheel, provides the connection between the tire and the vehicle.

"Wheel center member" means, in the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle.

S4 *Requirements.*

S4.1 *Size and Construction.* Each tire shall be designed to fit each non-pneumatic rim or wheel center member specified for its non-pneumatic tire identification code designation in a listing in accordance with section S4.4.

S4.2 *Performance Requirements*

S4.2.1 *General.* Each tire shall conform to the following:

(a) Its load rating shall be that specified in a submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for its non-pneumatic tire identification code designation.

(b) It shall incorporate a tread wear indicator that

will provide a visual indication that the tire has worn to a tread depth of 1/16 inch.

(c) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high speed performance procedure specified in S5.5, exhibit no visual evidence of tread or carcass separation, chunking or cracking.

(d) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 tires.

S4.2.2 *Test Requirements.*

S4.2.2.1 *Test Sample.* For each test sample use:

(a) One tire for physical dimensions, lateral strength, and strength in sequence;

(b) A second tire for tire endurance; and

(c) A third tire for high speed performance.

S4.2.2.2 *Physical Dimensions.* For a non-pneumatic tire assembly in which the tire is separable from the non-pneumatic rim or wheel center member, the dimensions, measured in accordance with S5.1, for that portion of the tire that attaches to that non-pneumatic rim or wheel center member shall satisfy the dimensional specifications contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S4.2.2.3. *Lateral Strength.* There shall be no visual evidence of tread or carcass separation, cracking or chunking, when a tire is tested in accordance with S5.2 to a load of:

(a) 1,500 pounds for tires with a load rating less than 880 pounds;

(b) 2,000 pounds for tires with a load rating of 880 pounds or more but less than 1,400 pounds.

(c) 2,500 pounds for tires with a load rating of 1,400 pounds or more, using the load rating marked on the tire or tire assembly.

S4.2.2.4 *Tire Strength.* There shall be no visual evidence of tread carcass separation, cracking or chunking, when a tire is tested in accordance with S5.3 to a minimum energy level of:

Load Rating	*Minimum Energy Level*
Below 880 pounds	1,950 inch pounds
880 pounds and above	2,600 inch pounds

S4.2.2.5 *Tire Endurance.* When the tire has been subjected to the laboratory endurance test specified in S5.4, using, if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.2.2.6 *High Speed Performance.* When the tire has been subjected to the laboratory high speed performance test specified in S5.5, using if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.3 *Labeling Requirements.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides of the tire or tire assembly in letters or numerals not less than 0.078 inches high, the information shown in paragraphs S4.3(a) through (f). Except, in the case of a non-pneumatic tire assembly of which one side always must face outward when mounted on a vehicle, the information shown in paragraphs S4.3(a) through (f) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in S4.4 of this standard or in 49 CFR §571.110 or 49 CFR §571.120.

(a) The non-pneumatic tire identification code.

(b) Load rating, which, if expressed in kilograms, shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole pound;

(c) For a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly, the size and type designation of the non-pneumatic rim or wheel tire assembly that is contained in the submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation;

(d) The name of the manufacturer or brand name;

(e) The symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(f) The tire identification number required by §574.5 of this chapter;

(g) The labeling requirements set forth in S6 of Standard No. 110 (§571.110), or S8 of Standard No. 120 (§571.120).

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 87-07; Notice 4)
RIN 2127-AC26

ACTION: Technical amendment.

SUMMARY: This notice corrects the labeling requirements of Standard No. 116, *Motor Vehicle Brake Fluids,* to reinstate portions of the standard that has been inadvertently removed through administrative error. Standard No. 116 had set forth detailed safety information that had to be labeled on brake fluid and hydraulic system mineral oil containers. When the method of placing this information on these containers was amended in 1988 (to allow the use of permanently affixed labels), the notice making the amendment inadvertently removed the portions of the standard which described the required information. This notice replaces those descriptive paragraphs.

EFFECTIVE DATE: October 11, 1990.

SUPPLEMENTARY INFORMATION: On June 28, 1988, the agency published a final rule, effective December 27, 1988, amending Standard No. 116 to permit the use of permanently-affixed labels (e.g., paper or plastic labels) on brake fluid containers to satisfy the container information requirements of the standard. (53 FR 24272) The amendatory language NHTSA chose to identify the portions of the standard that were changed was interpreted by the *Federal Register* as removing paragraphs in the standard that described the safety information that had to be placed on the containers (i.e., S5.2.2.2(a) through (g) and S5.2.2.3(a) through (e)). The agency wished to retain those paragraphs.

NHTSA's intent to retain the paragraphs is apparent in the preamble to the final rule. There the agency explained at length that the safety information placed on brake fluid containers is important for the proper storage and use of fluids. NHTSA stated:

> *The safety warning required on brake fluid and hydraulic system mineral oil containers warn against certain practices in using hydraulic fluid for braking systems that might result in the use of improper or contaminated fluids. The warnings also help to prevent improper storage of the brake fluid which could contaminate the fluid or cause it to absorb moisture. Avoiding the absorption of moisture is extremely important since moisture in a brake system degrades braking performance and safety by lowering the brake fluid's boiling point, increasing the fluid's viscosity at low atmospheric temperature and increasing the risk of brake system component corrosion. Lower boiling points increase the risk of brake system failure and increase the possibilities of vapor lock. The safety warnings also alert users of brake fluid containers with capacities less than five gallons that the containers should not be refilled. (53 FR at 24273).*

The preamble to the final rule only discussed amendments to the method of labeling the safety information on brake fluid containers (i.e., the introductory text to S5.2.2.2 and S5.2.2.3) and not changes in the agency's position regarding the benefits of labeling containers or the contents of that labeling.

The agency's intent to retain paragraphs S5.2.2.2(a) through (g) and S5.2.2.3(a) through (e) is further evidenced by the agency's referencing those paragraphs in S5.2.2.2 and S5.2.2.3 when NHTSA amended these sections in the June 1988 final rule. For example, the introductory text to S5.2.2.2 requires brake fluid packagers to "furnish the information specified in paragraph (a) through (g) of this section..."

Nevertheless, Standard No. 116 has been published without paragraphs S5.2.2.2(a) through (g) and S5.2.2.3(a) and through (e). This notice corrects that error by reinstating those paragraphs.

Because the amendment is corrective in nature and the public has already had notice and an opportunity to comment on the standard's labeling requirements, NHTSA, has determined that a second notice and opportunity to comment thereon are not necessary, and that for good cause shown that an effective date earlier than 180 days after issuance of the rule is in the public interest. The amendment is effective 30 days after publication in he *Federal Register*

In consideration of the foregoing, 49 CFR part 571 is amended as follows:

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

1. The authority citation for part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

2. Section 571.116 is amended by revising S5.2.2.2 and S5.2.2.3 to read as follows:

§ 571.116 Standard No. 116; Motor vehicle brake fluids.

* * * *

S5.2.2.2 Each packager of brake fluid shall furnish the information specified in paragraphs (a) through (g) of this S5.2.2.2 by clearly marking it on each brake fluid container or on a label (labels) permanently affixed to the container, in any location except a removable part such as a lid. After being subjected to the operations and conditions specified in S6.14, the information required by this section shall be legible to an observer having corrected visual acuity of 20/40 (Snellen ration) at a distance of one foot, and any label affixed to the container in compliance with this section shall not be removable without its being destroyed or defaced.

(a) Certification that the brake fluid conforms to §571.116.

(b) The name of the packager of the brake fluid, which may be in code form.

(c) The name and complete mailing address of the distributor.

(d) A serial number identifying the packaged lot and date of packaging.

(e) Designation of the contents as "DOT _____ MOTOR VEHICLE BRAKE FLUID" (Fill in "3," "4," or "5" as applicable).

(f) The minimum wet boiling point in Fahrenheit of the DOT brake fluid in the container.

(g) The following safety warning in capital and lower case letters as indicated:

(1) FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING BRAKE FLUID.

(2) KEEP BRAKE FLUID CLEAN AND DRY. Contamination with dirt, water, petroleum products or other materials may result in brake failure or costly repairs.

(3) STORE BRAKE FLUID ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED TO PREVENT ABSORPTION OF MOISTURE. (The last five words of the second sentence may be omitted from the labeling on DOT 5 containers.)

(4) *CAUTION:* DO NOT REFILL CONTAINER, AND DO NOT USE FOR OTHER LIQUIDS. (Not required for containers with a capacity in excess of 5 gallons.)

S5.2.2.3 Each packager of hydraulic system mineral oil shall furnish the information specified in paragraphs (a) through (e) of this S5.2.2.3 by clearly marking it on each brake fluid container or on a label (labels) permanently affixed to the container, in any location except a removable part such as a lid. After being subjected to the operations and conditions specified in S6.14, the information required by this section shall be legible to an observer having corrected visual acuity of 20/40 (Snellen ration) at a distance of one foot, and any label affixed to the container in compliance with this section shall not be removable without its being destroyed or defaced.

(a) The name of the packager of the hydraulic system mineral oil, which may be in code form.

(b) The name and complete mailing address of the distributor.

(c) A serial number identifying the packaged lot and date of packaging.

(d) Designation of the contents as "HYDRAULIC SYSTEM MINERAL OIL" in capital letters at least 1/8 of an inch high.

(e) The following safety warnings in capital and lower case letters as indicated:

(1) FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING HYDRAULIC SYSTEM MINERAL OIL.

(2) Hydraulic System Mineral Oil is NOT COMPATIBLE with the rubber components of brake systems designed for use with DOT brake fluids.

(3) KEEP HYDRAULIC SYSTEM MINERAL OIL CLEAN. Contamination with dust or other materials may result in brake failure or costly repair.

(4) *CAUTION:* STORE HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED. DO NOT REFILL CONTAINER OR USE OTHER LIQUIDS. (The last sentence is on in excess of 5 gallons.)

* * * *

Issued on September 5, 1990.

55 F.R. 37328
September 11, 1990

MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, and Motorcycles, and Brake Fluid and Brake Fluid Containers

(Docket No. 70-23; Notice 3)

S1. Scope. This standard specifies requirements for fluids for use in hydraulic brake systems of motor vehicles, containers for these fluids, and labeling of the containers.

S2. Purpose. The purpose of this standard is to reduce failures in the hydraulic braking systems of motor vehicles which may occur because of the manufacture or use of improper or contaminated fluid.

S3. Application. This standard applies to all fluid for use in hydraulic brake systems of motor vehicles. In addition, S5.3 applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles.

S4. Definitions.

"Blister" means a cavity or sac on the surface of a brake cup.

"Brake fluid" means a liquid designed for use in a motor vehicle hydraulic brake system in which it will contact elastomeric components made of styrene and butadiene rubber (SBR), ethylene and propylene rubber (EPR), polychloroprene (CR) brake hose inner tube stock or natural rubber (NR).

"Chipping" means a condition in which small pieces are missing from the outer surface of a brake cup.

"Hydraulic system mineral oil" means a mineral-oil-based fluid designed for use in motor vehicle hydraulic brake systems in which the fluid is not in contact with components made of SBR, EPR or NR.

"Duplicate samples" means two samples of brake fluid taken from a single packaged lot and tested simultaneously.

"Packager" means any person who fills containers with brake fluid that are subsequently distributed for retail sale.

"Packaged lot" is that quantity of brake fluid shipped by the manufacturer to the packager in a single container, or that quantity of brake fluid manufactured by a single plant run of 24 hours or less, through the same processing equipment and with no change in ingredients.

"Scuffing" means a visible erosion of a portion of the outer surface of a brake cup.

"Sloughing" means degradation of a brake cup as evidenced by the presence of carbon black loosely held on the brake cup surface, such that a visible black streak is produced when the cup, with a 500 ± 10 gram dead weight on it, is drawn base down over a sheet of white bond paper placed on a firm flat surface.

"Stickiness" means a condition on the surface of a brake cup such that fibers will be pulled from a wad of U.S.P. absorbent cotton when it is drawn across the surface.

S5. Requirements. This section specifies performance requirements for DOT 3, DOT 4 and DOT 5 brake fluids, requirements for brake fluid certification, and for container sealing, labeling and color coding for both brake fluids and hydraulic system mineral oils. Where a range of tolerances is specified, the brake fluid must be capable of meeting the requirements at all points within the range.

S5.1 Brake fluid. When tested in accordance with S6, brake fluids shall meet the following requirements.

S5.1.1 Equilibrium reflux boiling point (ERBP). When brake fluid is tested according to S6.1, the ERBP shall not be less than the following value for the grade indicated:

(a) DOT 3: 205°C (401°F)

(b) DOT 4: 230°C (446°F)

(c) DOT 5: 260°C (500°F)

S5.1.2 Wet ERBP. When brake fluid is tested according to S6.2, the wet ERBP shall not be less than the following value for the grade indicated:

(a) DOT 3: 140°C (284°F)

(b) DOT 4: 155°C (311°F)

(c) DOT 5: 180°C (356°F)

S5.1.3 Kinematic viscosities. When brake fluid is tested according to S6.3, the kinematic viscosities in centistokes (cSt) at stated temperatures shall be neither less than 1.5 cSt at 100° C. (212° F.) nor more than the following maximum value for the grade indicated:

(a) DOT 3: 1500 cSt at minus 40°C (minus 40° F)

(b) DOT 4: 1800 cSt at minus 40°C (minus 40° F)

(c) DOT 5: 900 cSt at minus 40°C (minus 40° F)

S5.1.4 pH value. When DOT 3 or DOT 4 brake fluid is tested according to S6.4, the pH value shall not be less than 7.0 or more than 11.5.

S5.1.5 Brake fluid stability.

S5.1.5.1 High-temperature stability. When brake fluid is tested according to S.6.5.3 the ERBP

shall not change by more than 3.0°C (5.4°F) plus 0.05 degree for each degree that the ERBP of the fluid exceeds 225°C (437°F).

S5.1.5.2 Chemical stability. When DOT 3 or DOT 4 brake fluid is tested according to S6.5.4, the change in temperature of the refluxing fluid mixture shall not exceed 3.0°C (5.4°F) plus 0.05 degree for each degree that the ERBP of the fluid exceeds 225°C (437°F).

S5.1.6 Corrosion. When brake fluid is tested according to S.6.6—

(a) The metal test strips shall not show weight changes exceeding the limits stated in Table I.

(b) Excluding the area of contact (13±1 mm. (½±1⁄32 inch) measured from the bolt hole end of the test strip), the metal test strips shall not show pitting or etching to an extent discernible without magnification;

(c) The water-wet brake fluid at the end of the test shall show no jelling at 23±5°C (73.4±9°F);

(d) No crystalline deposit shall form and adhere to either the glass jar walls or the surface of the metal strips;

(e) At the end of the test, sedimentation of the water-wet brake fluid shall not exceed 0.10 percent by volume;

(f) The pH value of water-wet DOT 3 and DOT 4 brake fluid at the end of the test shall not be less than 7.0 nor more than 11.5;

(g) The cups at the end of the test shall show no disintegration, as evidenced by blisters or sloughing;

(h) The hardness of the cup shall not decrease by more than 15 International Rubber Hardness Degrees (IRHD); and

TABLE 1

Test strip material	*Max. permissible weight change, mg/sq cm of surface*
Steel, Tinned Iron, Cast Iron	0.2
Aluminum	0.1
Brass, Copper	0.4

(i) The base diameter of the cups shall not increase by more than 1.4 mm. (0.055 inch).

S5.1.7 Fluidity and appearance at low temperature. When brake fluid is tested according to S6.7, at the storage temperature and for the storage times given in Table II—

(a) The fluid shall show no sludging, sedimentation, crystallization, or stratification;

(b) Upon inversion of the sample bottle, the time required for the air bubble to travel to the top of the fluid shall not exceed the bubble flow times shown in Table II; and

(c) On warming to room temperature, the fluid shall resume the appearance and fluidity that it had before chilling.

TABLE II—Fludity and Appearance at Low Temperatures

Storage temperature	*Storage time (hours)*	*Max. bubble flow time (seconds)*
minus 40±2°C (minus 40±3.6°F)	144±4.0	10
minus 50±2°C (minus 58±3.6°F)	6±0.2	35

S5.1.8 Evaporation. When brake fluid is tested according to S6.8—

(a) The loss by evaporation shall not exceed 80 percent by weight;

(b) The residue from the brake fluid after evaporation shall contain no precipitate that remains gritty or abrasive when rubbed with the fingertip; and

(c) The residue shall have a pour point below minus 5°C (+23°F).

S5.1.9 Water tolerance.

(a) *At low temperature.* When brake fluid is tested according to [S6.9.3(a)—]

(1) The fluid shall show no sludging, sedimentation, crystallization, or stratification;

(2) Upon inversion of the centrifuge tube, the air bubble shall travel to the top of the fluid in not more than 10 seconds;

(3) If cloudiness has developed, the wet fluid shall regain its original clarity and fluidity when warmed to room temperature; and

(b) *At 60° C. (140° F.).* When brake fluid is tested according to [S6.9.3(b)—]

(1) The fluid shall show no stratification; and

(2) Sedimentation shall not exceed 0.15 percent by volume after centrifuging.

S5.1.10 Compatibility.

(a) *At low temperature.* When brake fluid is tested according to S6.10.3(a) the test specimen shall show no sludging, sedimentation, or crystallization. In addition DOT 3 and DOT 4 fluids shall show no stratification.

(b) *At 60° C. (140° F.).* When brake fluid is tested according to S6.10.3(b)—

(1) Sedimentation shall not exceed 0.05 percent by volume after centrifuging; and

(2) DOT 3 and DOT 4 fluids shall show no stratification.

S5.1.11 Resistance to oxidation. When brake fluid is tested according to S6.11—

(a) The metal test strips outside the areas in contact with the tinfoil shall not show pitting or etching to an extent discernible without magnification;

(b) No more than a trace of gum shall be deposited on the test strips outside the areas in contact with the tinfoil;

(c) The aluminum strips shall not change in weight by more than 0.05 mg/sq cm; and

(d) The cast iron strips shall not change in weight by more than 0.3 mg/sq cm.

S5.1.12 Effects on cups. When brake cups are subjected to brake fluid in accordance with [S6.12]—

(a) The increase in the diameter of the base of the cups shall be not less than 0.15 mm (0.006 inch) or more than 1.40 mm (0.055 inch);

(b) The decrease in hardness of the cups shall be not more than 10 IRHD at 70°C (158°F) or more than 15 IRHD at 120°C (248°F), and there shall be no increase in hardness of the cups; and

(c) The cups shall show no disintegration as evidenced by stickiness, blisters, or sloughing.

S5.1.13 Stroking properties. When brake fluid is tested according to S6.13—

(a) Metal parts of the test system shall show no pitting or etching to an extent discernible without magnification;

(b) The change in diameter of any cylinder or piston shall not exceed 0.13 mm (0.005 inch);

(c) The average decrease in hardness of seven of the eight cups tested (six wheel cylinder and one master cylinder primary) shall not exceed 15 IRHD. Not more than one of the seven cups shall have a decrease in hardness greater than 17 IRHD;

(d) None of the eight cups shall be in an unsatisfactory operating condition as evidenced by stickiness, scuffing, blisters, cracking, chipping, or other change in shape from its original appearance;

(e) None of the eight cups shall show an increase in base diameter greater than 0.90 mm (0.035 inch);

(f) The average lip diameter set of the eight cups shall not be greater than 65 percent;

(g) During any period of 24,000 strokes, the volume loss of fluid shall not exceed 36 milliliters;

(h) The cylinder pistons shall not freeze or function improperly throughout the test;

(i) The total loss of fluid during the 100 strokes at the end of the test shall not exceed 36 milliliters;

(j) The fluid at the end of the test shall show no formation of gels;

(k) At the end of the test the amount of sediment shall not exceed 1.5 percent by volume; and

(l) Brake cylinders shall be free of deposits that are abrasive or that cannot be removed when rubbed moderately with a nonabrasive cloth wetted with ethanol.

S5.1.14 Fluid color. Brake fluid and hydraulic system mineral oil manufactured on or after September 1, 1978, shall be of the color indicated:

DOT 3 and DOT 4—colorless to amber.
DOT 5—purple.
Hydraulic system mineral oil—green.

S5.2 Packaging and labeling requirements for motor vehicle brake fluids.

S5.2.1 Container sealing. Each brake fluid or hydraulic system mineral oil container with a capacity of 6 fluid ounces or more shall be provided with a resealable closure that has an inner seal impervious to the packaged brake fluid. The container closure shall include a tamper-proof feature that will either be destroyed or substantially altered when the container closure is initially opened.

S5.2.2 Certification, marking, and labeling.

S5.2.2.1 Each manufacturer of a DOT grade brake fluid shall furnish to each packager, distributor, or dealer to whom he delivers brake fluid, the following information:

(a) A serial number identifying the production lot and the date of manufacture of the brake fluid.

(b) The grade (DOT 3, DOT 4, or DOT 5) of the brake fluid.

(c) The minimum wet boiling point in Fahrenheit of the brake fluid.

(d) Certification that the brake fluid conforms to Federal Motor Vehicle Safety Standard No. 116.

S5.2.2.2 Each packager of a brake fluid shall furnish the information specified in paragraphs (a) through (g) of this section by clearly marking it on each brake fluid container or on a label (labels) permanently affixed to the container, in any location except a removable part such as a lid. After being subjected to the operations and conditions specified in S6.14, the information required by this section shall be legible to an observer having corrected visual acuity of 20/40 (Snellen ratio) at a distance of one foot, and any label affixed to the container in compliance with this section shall not be removable without its being destroyed or defaced.

(a) Certification that the brake fluid conforms to § 571.116.

(b) The name of the packager of the brake fluid, which may be in code form.

(c) The name and complete mailing address of the distributor.

(d) A serial number identifying the packaged lot and date of packaging.

(e) Designation of the contents as "DOT____MOTOR VEHICLE BRAKE FLUID" (Fill "3," "4," or "5" as applicable).

(f) The minimum wet boiling point in Fahrenheit of the DOT brake fluid in the container.

(g) The following safety warnings in capital and lower case letters as indicated:

(1) FOLLOW VEHICLE MANUFACTURERS RECOMMENDATIONS WHEN ADDING BRAKE FLUID.

(2) KEEP BRAKE FLUID CLEAN AND DRY. Contamination with dirt, water, petroleum products or other materials may result in brake failure or costly repairs.

(3) STORE BRAKE FLUID ONLY IN ITS ORGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED TO PREVENT ABSORPTION OF MOISTURE. (The last five words of the second sentence may be omitted from the labeling on DOT 5 containers.)

(4) *CAUTION*: DO NOT REFILL CONTAINER, AND DO NOT USE FOR OTHER LIQUIDS. (Not required for containers with a capacity in excess of 5 gallons.)

S5.2.2.3 Each packager of hydraulic system mineral oil shall furnish the information specified in paragraphs (a) through (e) of this section by clearly marking it on each brake fluid container or on a label (labels) permanently affixed to the container, in any location except a removable part such as a lid. After being subjected to the operations and conditions specified in S6.14, the information required by this section shall be legible to an observer having corrected visual acuity of 20/40 (Snellen ratio) at a distance of one foot, and any label affixed to the container in compliance with this section shall not be removable without its being destroyed or defaced.

[(a) The name of the packager of the hydraulic system mineral oil, which may be in code form.

(b) The name of complete mailing address of the distributor.

(c) A serial number identifying the packaged lot and date of packaging.

(d) Designation of the contents as "HYDRAULIC SYSTEM MINERAL OIL" in capital letters at least 1/8 of an inch high.

(e) The following safety warnings in capital and lower case letters as indicated:

(1) FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING HYDRAULIC SYSTEM MINERAL OIL.

(2) Hydraulic System Mineral Oil is NOT COMPATIBLE with the rubber components of brake systems designed for use with DOT brake fluids.

(3) KEEP HYDRAULIC SYSTEM MINERAL OIL CLEAN. Contamination with dust or other materials may result in brake failure or costly repair.

(4) *CAUTION:* STORE HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED. DO NOT REFILL CONTAINER OR USE OTHER LIQUIDS. (The last sentence is not required for containers with a capacity in excess of 5 gallons.) **(55 F.R. 37328—September 11, 1990. Effective: October 11, 1990)]**

S5.2.2.4 If a container for brake fluid or hydraulic system mineral oil is not normally visible but designed to be protected by an outer container or carton during use, the outer container or carton rather than the inner container shall meet the labeling requirements of S5.2.2.2 or S5.2.2.3, as appropriate.

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems
(Docket No. 87-04; Notice 7)

ACTION: Final rule; partial response to petitions for reconsideration; delay of effective date.

SUMMARY: In a final rule published in the *Federal Register* (53 FR 7931) on March 11, 1988, NHTSA amended Standard No. 121, *Air Brake Systems*, to clarify the standard's parking brake requirements. The amendments permitted manufacturers to comply with the new requirements as an alternative to complying with the requirements being superseded effective April 11, 1988, and required mandatory compliance with those requirements effective September 7, 1988 (180 days after publication).

NHTSA received two petitions for reconsideration of that final rule, from Navistar International Corporation and Volvo GM Heavy Truck Corporation. In partial response to the two petitions for reconsideration, NHTSA extended the period for which manufacturers may comply with either the earlier or new requirements, first to September 7, 1989, and later to September 7, 1990. In February 1990, NHTSA provided a further response to the petitions and proposed revisions to the requirements at issue. This notice amends Standard No. 121 by extending the period for which manufacturers may comply with either the earlier or new requirements for one more year, i.e., until September 7, 1991. This extension will permit the agency to complete its analysis of the comments on the February 1990 notice of proposed rulemaking (NPRM), and reach a decision of whether to go forward with the proposed changes, prior to the time the 1988 amendments become effective on a mandatory basis.

DATES: The amendments made by this rule were effective September 7, 1990.

SUPPLEMENTARY INFORMATION: In a final rule published in the *Federal Register* (53 FR 7931) on March 11, 1988, NHTSA amended Standard No. 121, *Air Brake Systems*, to clarify the standard's parking brake requirements. The amendments required actuation of a mechanical means for holding the parking brakes within three seconds after operation of the parking brake control. (For trailers, such actuation was required within three seconds after venting to the atmosphere of the front supply line connection is initiated.) In addition, vehicles were required to be capable of meeting requirements related to parking brake retardation force within the three second period. The amendments also required that the grade holding test (or alternative drawbar test) be met with only the mechanical means of holding the parking brakes in operation. The amendments required mandatory compliance effective September 7, 1988 (180 days after publication), while permitting manufacturers to comply with the new requirements as an alternative to complying with the requirements being superseded effective April 11, 1988.

The agency stated in the March 1988 notice that it believed all parking brakes currently being sold complied with the amendments being adopted. The agency also stated its belief that since any necessary certification could be accomplished by engineering analysis and simple tests, 180 days provided a sufficient time for that purpose.

NHTSA received two petitions for reconsideration. One of the petitioners, Volvo GM Heavy Truck Corporation, requested that the agency rescind the application of the timing amendment to tandem trucks with spring brakes, and that one of the specified conditions for the timing tests (initial reservoir system pressure of 100 psi) be removed. That company asserted that compliance with the standard as amended is not practicable and is unreasonable. Volvo GM suggested that NHTSA was generally correct in stating that the rule did not affect parking brakes currently being sold, but that the agency had overlooked a significant segment of the vehicle population, heavy tandem trucks. That company submitted test results for two heavy trucks. According to Volvo GM, "one exceeds the limit and the other does not contain compliance margins sufficient to accommodate manufacturing tolerances." That company also argued that the test condition which specifies initial reservoir system pressure of 100 psi is design restrictive.

The other petitioner, Navistar International

Transportation Corporation, stated that it has confirmed that in its parking brake systems the air pressure drops to zero within the allotted time. That company stated that based upon this fact and the agency's statements in the preamble, it believes that its vehicles comply with the timing requirements of the final rule. Navistar International added, however, that after actuation of the control knob, experience has shown that as much as one revolution of the braked wheels may be necessary to permit the brake shoes to be sufficiently energized to reach peak torque. That company stated that this "wrap up" process can take several seconds, depending on brake characteristics and driver finesse. Navistar International stated that should this "wrap up" movement not be considered permissible by the agency, it requested that its submission be considered a petition for reconsideration of the final rule, to permit the "wrap up" movement.

As is clear from the preamble to the March 1988 final rule, NHTSA did not believe that the amendments would require changes in any parking brakes currently being sold. NHTSA was therefore concerned that the petitions raised the possibility that, contrary to the agency's belief in establishing the March 1988 final rule, some current parking brakes did not comply with the amended requirements.

In partial response to the two petitions for reconsideration, NHTSA extended the period for which manufacturers may comply with either the earlier or new requirements, first to September 7, 1989 (53 FR 35075; September 9, 1988), and later to September 7, 1990 (54 FR 25460; June 15, 1989). In February 1990, NHTSA provided a further response to the petitions and proposed revisions to the requirements at issue (55 FR 4447, February 8, 1990).

NHTSA is now in the process of reviewing the comments submitted in response to the February 1990 NPRM. The agency expects to complete its analysis of the comments and reach a decision of whether to go forward with the proposed changes no later than the first half of next year. However, mandatory compliance with the March 1988 requirements is scheduled to become effective on September 7, 1990. Without a delay in the effective date, some manufacturers may not be able to certify that certain vehicles comply with Standard No. 121.

Accordingly, in partial response to the two petitions for reconsideration, NHTSA has decided to delay, for one additional year, the time the amendments become effective on a mandatory basis. This delay in effective date will permit the agency to complete its analysis of the comments on the February 1990 NPRM, and reach a decision of whether to go forward with the proposed changes, prior to the time the 1988 amendments become effective on a mandatory basis. Thus, manufacturers may continue until September 7, 1991, to comply with either the March 1988 requirements or the requirements that were superseded by that notice.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

§571.121 [Amended]

S5.6.3 of §571.121 is revised to read as follows:

S5.6.3 *Application and holding.* Each parking brake system shall meet the requirements of S5.6.3.1 through S5.6.3.4, except that, at the option of the manufacturer, vehicles manufactured before September 7, 1991 may meet the requirements specified in S5.6.3.5.

S5.6.3.1 The parking brake system shall be capable of achieving the minimum performance specified either in S5.6.1 or S5.6.2 with any single leakage-type failure, in any other brake system, of a part designed to contain compressed air or brake fluid (except failure of a component of a brake chamber housing).

S5.6.3.2 For trucks and buses, with an initial reservoir system pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, at all times after three seconds from the time of actuation of the parking brake control, the parking brake system shall achieve the minimum parking retardation performance specified in S5.6.3.1. For trailers, with an initial supply line pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, at all times after three seconds from the time venting to the atmosphere of the front supply line connection is initiated, the parking brake system shall achieve the minimum retardation performance specified in S5.6.3.1.

S5.6.3.3 A mechanical means shall be provided which is capable, with zero air pressure and zero fluid pressure in the vehicle and without electrical power, of holding the parking brake application at a level meeting the minimum parking retardation performance specified in S5.6.3.1.

S5.6.3.4 For trucks and buses, with an initial reservoir system pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, no later than three seconds from the time of operation of the parking brake control, the mechanical means referred to in S5.6.3.3 shall be actuated. For trailers, with an initial supply line pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, no later than three seconds from the time venting to the atmosphere of the front supply line connection is

initiated, the mechanical means referred to in S5.6.3.3 shall be actuated.

S5.6.3.5 *(Optional requirement for vehicles manufactured before September 7, 1991)* The parking brake system shall be capable of achieving the minimum performance specified either in S5.6.1 or S5.6.2 with any single leakage-type failure, in any other brake system, of a part designed to contain compressed air or brake fluid (except failure of a component of a brake chamber housing). Once applied, the parking brakes shall be held in the applied position solely by mechanical means.

Issued on August 9, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 33318
August 15, 1990

Repeat the procedure six times, increasing the brake chamber air pressure by 10. After each stop, rotate the brake drum or disc until the temperature of the brake falls to between 125°F. and 200°F.

S5.4.2 Brake power. When mounted on an inertia dynamometer, each brake shall be capable of making 10 consecutive decelerations at an average rate of 9 fpsps from 50 mph to 15 mph, at equal intervals of 72 seconds, and shall be capable of declerating to a stop from 20 mph at an average deceleration rate of 14 fpsps one minute after the 10th acceleration. The series of decelerations shall be conducted as follows:

S5.4.2.1 With an initial brake temperature between 150°F and 200°F for the first brake application, and the drum or disc rotating at a speed equivalent to 50 mph, apply the brake and decelerate at an average deceleration rate of 9 fpsps to 15 mph. Upon reaching 15 mph, accelerate to 50 mph and apply the brake for a second time 72 seconds after the start of the first application. Repeat the cycle until 10 decelerations have been made. The service line air pressure shall not exceed 100 psi during any deceleration.

S5.4.2.2 One minute after the end of the last deceleration required by S5.4.2.1 and with the drum or disc rotating at a speed of 20 mph, decelerate to a stop at an average deceleration rate of 14 fpsps.

S5.4.3 Brake recovery. Starting 2 minutes after completing the tests required by S5.4.2, the brake of a vehicle other than either front axle brake of a truck-tractor shall be capable of making 20 consecutive stops from 30 mph at an average deceleration rate of 12 ft/s/s, at equal intervals of 1 minute measured from the start of each brake application. The service line air pressure needed to attain a rate of 12 ft/s/s shall be not more than 85 lb./in.^{2}, and not less than 20 lb./in.^{2} for a brake not subject to the control of an antilock system, or 12 lb./in.^{2} for a brake subject to the control of an antilock system.

S5.5 Antilock system.

S5.5.1 Antilock system failure. On a vehicle equipped with an antilock system, electrical failure of any part of the antilock system shall not increase the actuation and release times of the service brakes.

S5.5.2 Antilock system power—trailers. On a trailer equipped with an antilock system that requires electrical power for operation, the power shall be obtained from the stop lamp circuit. Additional circuits may also be used to obtain redundant sources of electrical power.

S5.6 Parking brake system. Each vehicle other than a trailer converter dolly shall have a parking brake system that under the conditions of S6.1 meets the requirements of S5.6.1 or S5.6.2, at the manufacturer's option, and the requirements of S5.6.3 and S5.6.4. However, the trailer portion of an auto transporter manufactured before January 1, 1980 and any agricultural commodity trailer, heavy hauler trailer, or pulpwood trailer, shall meet the requirements of this section, or, at the option of the manufacturer, the requirements of § 393.43 of the title.

S5.6.1 Static retardation force. With all other brakes rendered inoperative, during a static drawbar pull in a forward or rearward direction, the static retardation force produced by the application of the parking brakes shall be:

(a) In the case of a vehicle other than a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

is not less than 0.28 for any axle other than a steerable front axle; and

(b) In the case of a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GVWR}}$$

is not less than 0.14.

S5.6.2 Grade holding. With all parking brakes applied, the vehicle shall remain stationary facing uphill and facing downhill on a smooth, dry portland cement concrete roadway with a 20%

grade, both (a) when loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation).

S5.6.3 Application and holding. Each parking brake system shall meet the requirements of S5.6.3.1 through S5.6.3.4, except that, at the option of the manufacturer, vehicles manufactured before September 7, [1991], may meet the requirements specified in S5.6.3.5. **(55 F.R. 33318—August 15, 1990. Effective September 7, 1990)**

S5.6.3.1 The parking brake system shall be capable of achieving the minimum performance specified either in S5.6.1 or S5.6.2 with any single leakage-type failure, in any other brake system, of a part designed to contain compressed air or brake fluid (except failure of a component of a brake chamber housing).

S5.6.3.2 For trucks and buses, with an initial reservoir system pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, at all times after three seconds from the time of actuation of the parking brake control, the parking brake system shall achieve the minimum parking retardation performance specified in S5.6.3.1. For trailers, with an initial supply line pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, at all times after three seconds from the time venting to the atmosphere of the front supply line connection is initiated, the parking brake system shall achieve the minimum retardation performance specified in S5.6.3.1.

S5.6.3.3 A mechanical means shall be provided which is capable, with zero air pressure and zero fluid pressure in the vehicle and without electrical power, of holding the parking brake application at a level meeting the minimum parking retardation performance specified in S5.6.3.1.

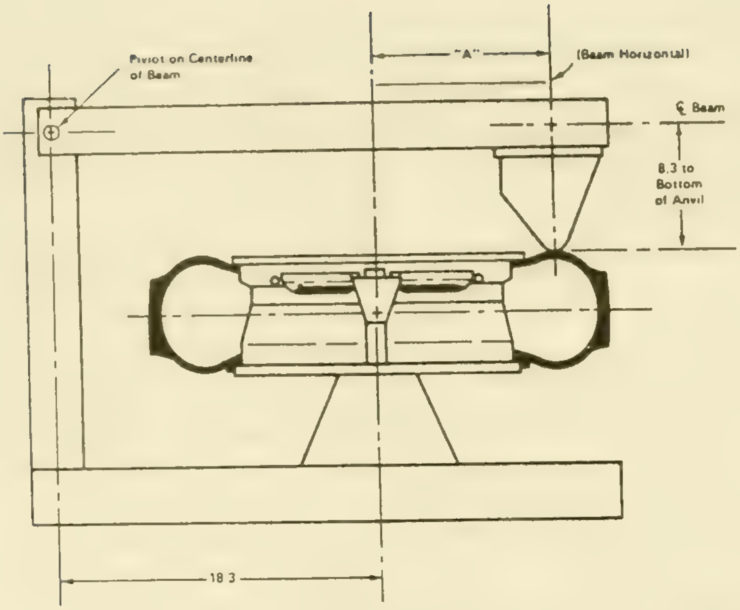
S5.6.3.4 For trucks and buses, with an initial reservoir system pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, no later than three seconds from the time of operation of the parking brake control, the mechanical means referred to in S5.6.3.3 shall be actuated. For trailers, with an initial supply line pressure of 100 psi and, if designed to tow a vehicle equipped with air brakes, with a 50 cubic inch test reservoir connected to the supply line coupling, no later than three seconds from the time venting to the atmosphere of the front supply line connection is initiated, the mechanical means referred to in S5.6.3.3 shall be actuated.

S5.6.3.5. Optional requirement for vehicles manufactured before September 7, [1991]. The parking brake system shall be capable of achieving the minimum performance specified either in S5.6.1 or S5.6.2. with any single leakage-type failure, in any other brake system, of a part designed to contain compressed air or brake fluid (except failure of a component of a brake chamber housing). Once applied, the parking brakes shall be held in the applied position solely by mechanical means. **(55 F.R. 33318—August 15, 1990. Effective: September 7, 1990)**

S5.6.4 Parking brake control—trucks and buses. The parking brake control shall be separate from the service brake control. It shall be operable by a person seated in the normal driving position. The control shall be identified in a manner that specifies the method of control operation. The parking brake control shall control the parking brakes of the vehicle and of any air braked vehicle that it is designed to tow.

S5.7 Emergency brake system—trucks and buses. Each vehicle shall be equipped with an emergency brake system which, under the conditions of S6.1, conforms to the requirements of S5.7.1 through S5.7.3. However, the truck portion of an auto transporter need not meet the road test requirements of S5.7.1 and S5.7.3.

S5.7.1 Emergency brake system performance. When stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 81, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold brake

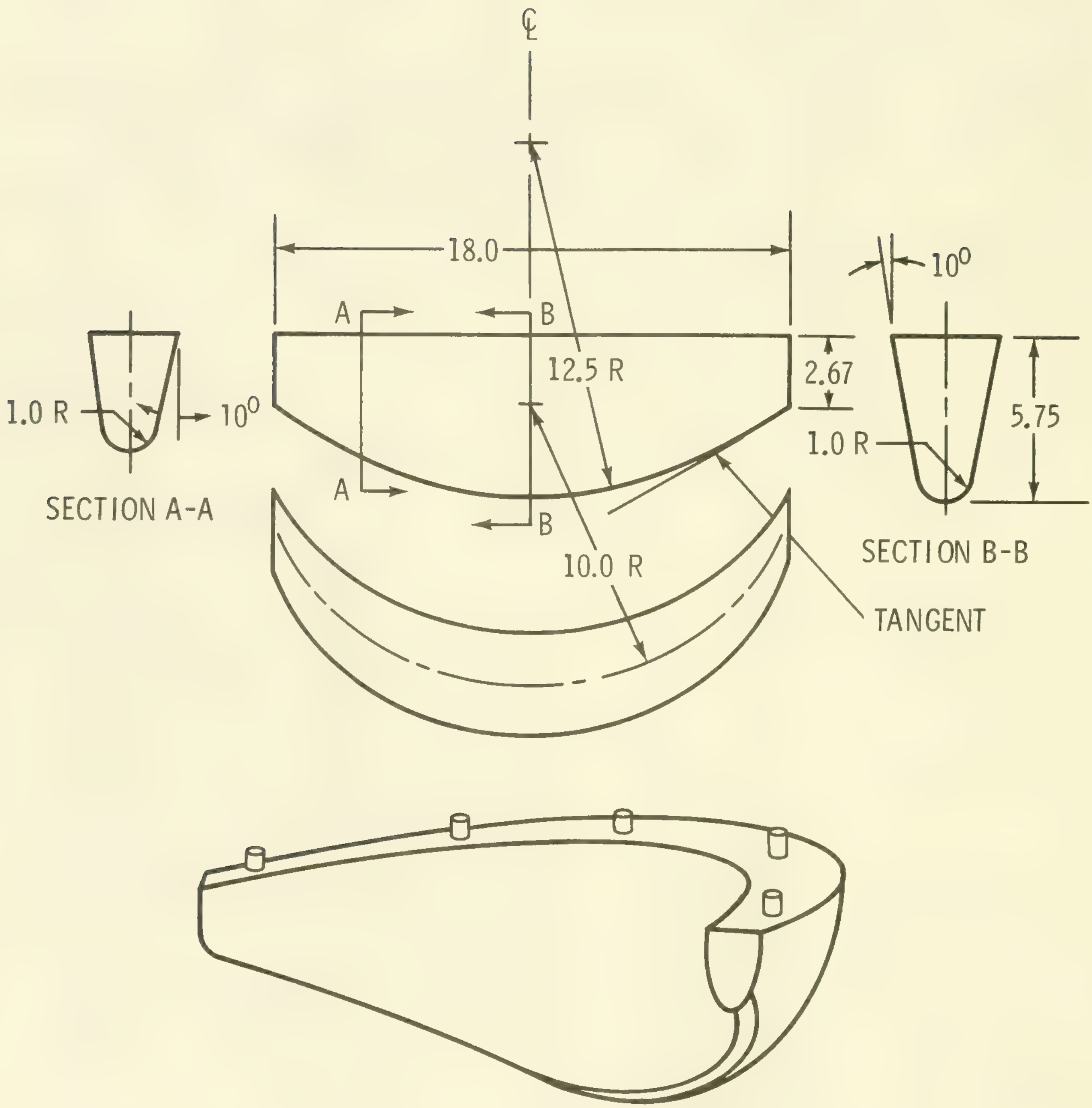


Wheel Size	*Dimension "A" for tires with maximum inflation pressure*	
	Other than 60 lbs/in²	*60 lbs/in²*
[18	....	11.40]
17	12.00	10.60
16	11.50	9.90
15	11.00	9.40
14	10.50	8.90
13	10.00	8.40
12	9.50	....
11	9.00	....
10	8.50	....
320mm	8.50	....
340mm	9.00	....
345mm	9.25	....
365mm	9.75	....
370mm	10.00	....
390mm	11.00	....
415mm	11.50	....
400mm(1)	10.25	....
425mm(1)	10.75	....
450mm(1)	11.25	....
475mm(1)	11.75	....
500mm(1)	12.25	....

(1) for CT tires only

Figure 1—Bead Unseating Fixture—Dimensions in Inches

(55 F.R. 6288—February 15, 1991. Effective: March 18, 1991)



MATERIAL: Cast Aluminum 355
T-6 Condition
Finish-50 Micro Inch

FIGURE 2—Diagram of Bead Unseating Block Dimensions in Inches

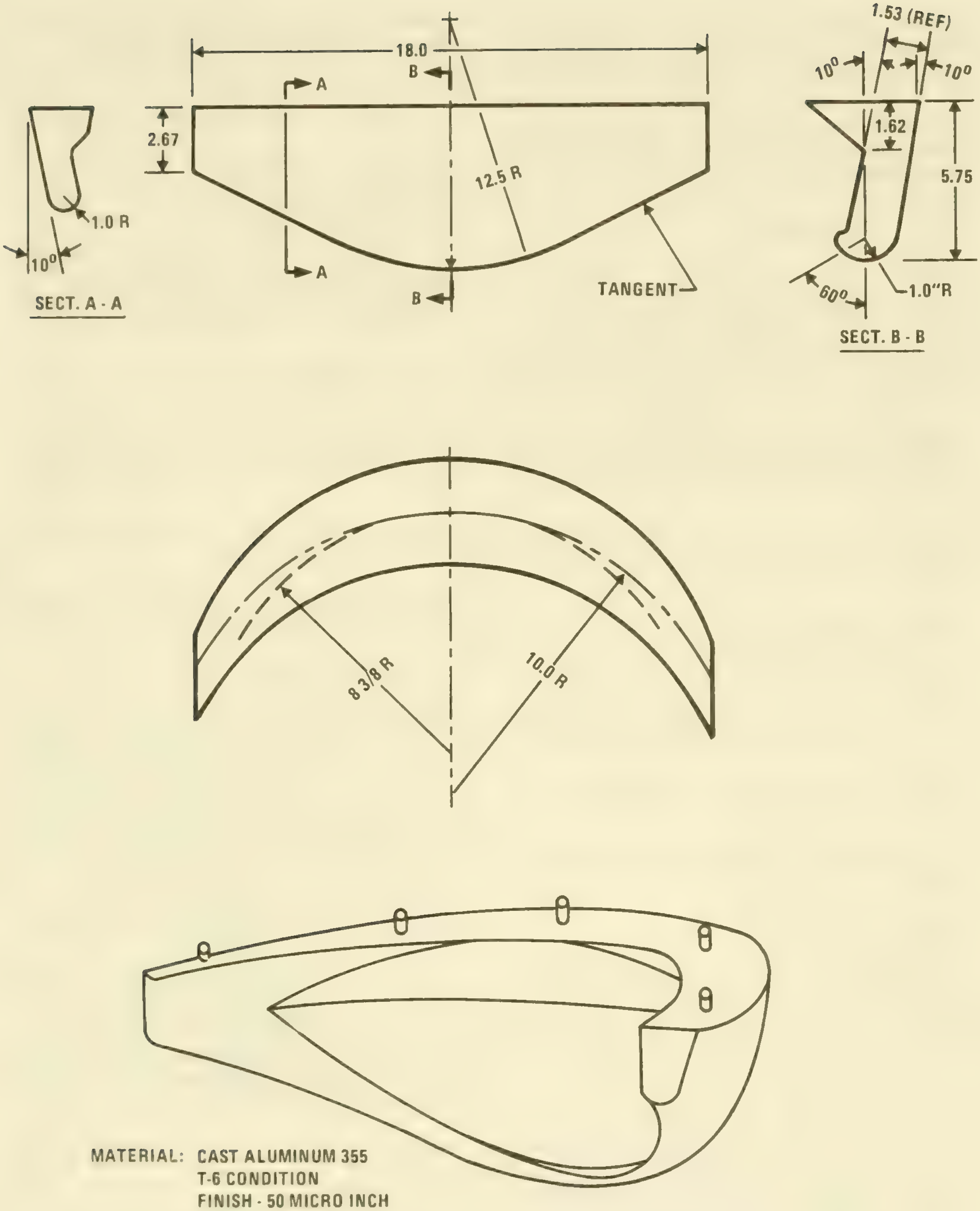


FIGURE 2A—Diagram of Bead Unseating Block Dimensions in Inches

S5.2.1.3 Mount the wheel and tire in the fixture shown in Figure 1, and force the bead unseating block shown in Figure 2 or Figure 2A against the tire sidewall as required by the geometry of the fixture. However, in testing a tire that has an inflation pressure of 60 psi, only use the bead unseating block described in Figure 2A.

S5.2.2 Test procedure.

S5.2.2.1 Apply a load through the block to the tire outer sidewall at the distance specified in Figure 1 for the applicable wheel size at a rate of 2 inches per minute, with the load arm substantially parallel to the tire and rim assembly at the time of engagement.

S5.2.2.2 Increase the load until the bead unseats or the applicable value specified in S4.2.2.3 is reached.

S5.2.2.3 Repeat the test at least four places equally spaced around the tire circumference.

S5.3 Tire strength.

S5.3.1 Preparation of tire.

S5.3.1.1 Mount the tire on a test rim and inflate it to the applicable pressure specified in Table II;

S5.3.1.2 Condition it at room temperature for at least 3 hours; and

S5.3.1.3 Readjust its pressure to that specified in S5.3.1.1.

S5.3.2 Test procedure.

S5.3.2.1 Force a ¾-inch-diameter cylindrical steel plunger with a hemispherical end perpendicularly into the tread rib as near to the centerline as possible, avoiding penetration into the tread groove, at the rate of 2 inches per minute.

S5.3.2.2 Record the force and penetration at five test points equally spaced around the circumference of the tire. If the tire fails to break before the plunger is stopped by reaching the rim, record the force and penetration as the rim is reached and use these values in S5.3.2.3.

S5.3.2.3 Compute the breaking energy for each test point by means of the following formula:

$$W = \frac{F \times P}{2}$$

where

W = Energy, inch-pounds;
F = Force, pounds; and
P = Penetration, inches.

S5.3.2.4 Determine the breaking energy value for the tire by computing the average of the five values obtained in accordance with S5.3.2.3.

S5.4 Tire endurance.

S5.4.1 Preparation of tire.

S5.4.1.1 Mount a new tire on a test rim and inflate it to the applicable pressure specified in Table II.

S5.4.1.2 Condition the tire assembly to 100 ± 5°F. for at least three hours.

S5.4.1.3 Readjust tire pressure to that specified in S5.4.1.1 immediately before testing.

S5.4.2 Test procedure.

S5.4.2.1 Mount the tire and wheel assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the section width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's size designation, type, and maximum permissible inflation pressure.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5°F.

S5.4.2.3 Conduct the test at 50 miles per hour in accordance with the following schedule without pressure adjustment or other interruptions:

[The loads for the following periods are the specified percentage of the maximum load rating marked on the tire sidewall:

	Percent
4 hours	85
6 hours	90
24 hours	100

(46 F.R. 61473—December 17, 1981. Effective: 6/16/82)]

S5.4.2.4 Immediately after running the tire the required time, measure its inflation pressure. Allow the tire to cool for one hour. Then deflate the tire, remove it from the test rim, and inspect it for the conditions specified in S4.2.2.5(a).

S5.5 High-speed performance.

S5.5.1 [After preparing the tire in accordance with S5.4.1, mount the tire and wheel assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's maximum load rating as marked on the tire sidewall. **(46 F.R. 61473—December 17, 1981. Effective: 6/16/82)**]

S5.5.2 Break in the tire by running it for 2 hours at 50 mph.

S5.5.3 Allow it to cool to $100 \pm 5°F$ and readjust the inflation pressure to the applicable pressure specified in Table II.

S5.5.4 Without readjusting inflation pressure, test at 75 mph for 30 minutes, 80 mph for 30 minutes, and 85 mph for 30 minutes.

S5.5.5 Immediately after running the tire the required time, measure its inflation pressure. Allow the tire to cool for one hour. Then deflate the tire, remove it from the test rim, and inspect it for the conditions specified in S4.2.2.5(a).

S6. Nonconforming tires. [No tire that is designed for use on passenger cars and manufactured on or after October 1, 1972, but does not conform to all the requirements of this standard, shall be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose. **(46 F.R. 61473—December 17, 1981. Effective: 6/16/82)**]

Table I—Minimum Breaking Energy Values (Inch-Pounds)

Table I-A.—For Bias Ply Tires With Designated Section Width 6 Inches and Above

Cord Material	Maximum permissible inflation						
	32 lbs in²	36 lbs in²	40 lbs in²	240 kPa	280 kPa	300 kPa	340 kPa
Rayon Nylon or in-lbs)	1,650	2,574	3,300	1,650	3,300	1,650	3,300
Polyester (in-lbs)	2,600	3,900	5,200	2,600	5,200	2,600	5,200

(1) For CT tires only

Table I-B.—For Bias Ply Tires With Designated Section Width Below 6 Inches

Cord Material	Maximum permissible inflation						
	32 lbs in²	36 lbs in²	40 lbs in²	240 kPa	280 kPa	300 kPa	340 kPa
Rayon Nylon or (in-lbs)	1,000	1,875	2,500	1,000	2,500	1,000	2,500
Polyester (in-lbs)	1,950	2,925	3,900	1,900	3,900	1,950	3,900

(1) For CT tires only

Table I-C.—For Radial Ply Tires

Size Designation	Maximum permissible inflation										
	32 lbs in²	36 lbs in²	40 lbs in²	240 kPa	280 kPa	300 kPa	340 kPa	[(1) 290 kPa	(1) 330 kPa	(1) 350 kPa	(1) 390 kPa
Below 160 mm (in-lbs)	1,950	2,925	3,900	1,950	3,900	1,950	3,900	1,950	3,900	1,950	3,900
160 mm or above (in-lbs)	2,600	3,900	5,200	2,600	5,200	2,600	5,200	2,600	5,200	2,600	5,200]

(1) For CT tires only

Table I—D.For Tires With 60 lb./in² Maximum Permissible Inflation Pressure and Maximum Load Rating of 880 Pounds and Above

Cord Material	Inch-Pounds
Rayon	1,650
Nylon or Polyester	2,600

Table I—E.—For Tires With 60 lb./in² Maximum Permissible Inflation Pressure and Maximum Load Rating Below 880 Pounds

Cord Material	Inch-Pounds
Rayon	1,000
Nylon or Polyester	1,950

Table II.—Test Inflation Pressures

Test Type	Maximum permissible inflation pressure to be used for the following test:											
	lbs/in²				kPa				[kPa (1)			
	32	36	40	60	240	280	300	340	290	330	350	390
Physical dimensions, bead unseating, tire strength, and tire endurance	24	28	32	52	180	220	180	220	230	270	230	270
High speed performance	30	34	38	58	220	260	220	260	270	310	270	310

(1) For CT tires only] [55 F.R. 49618—November 30, 1990. Effective: December 31, 1990]

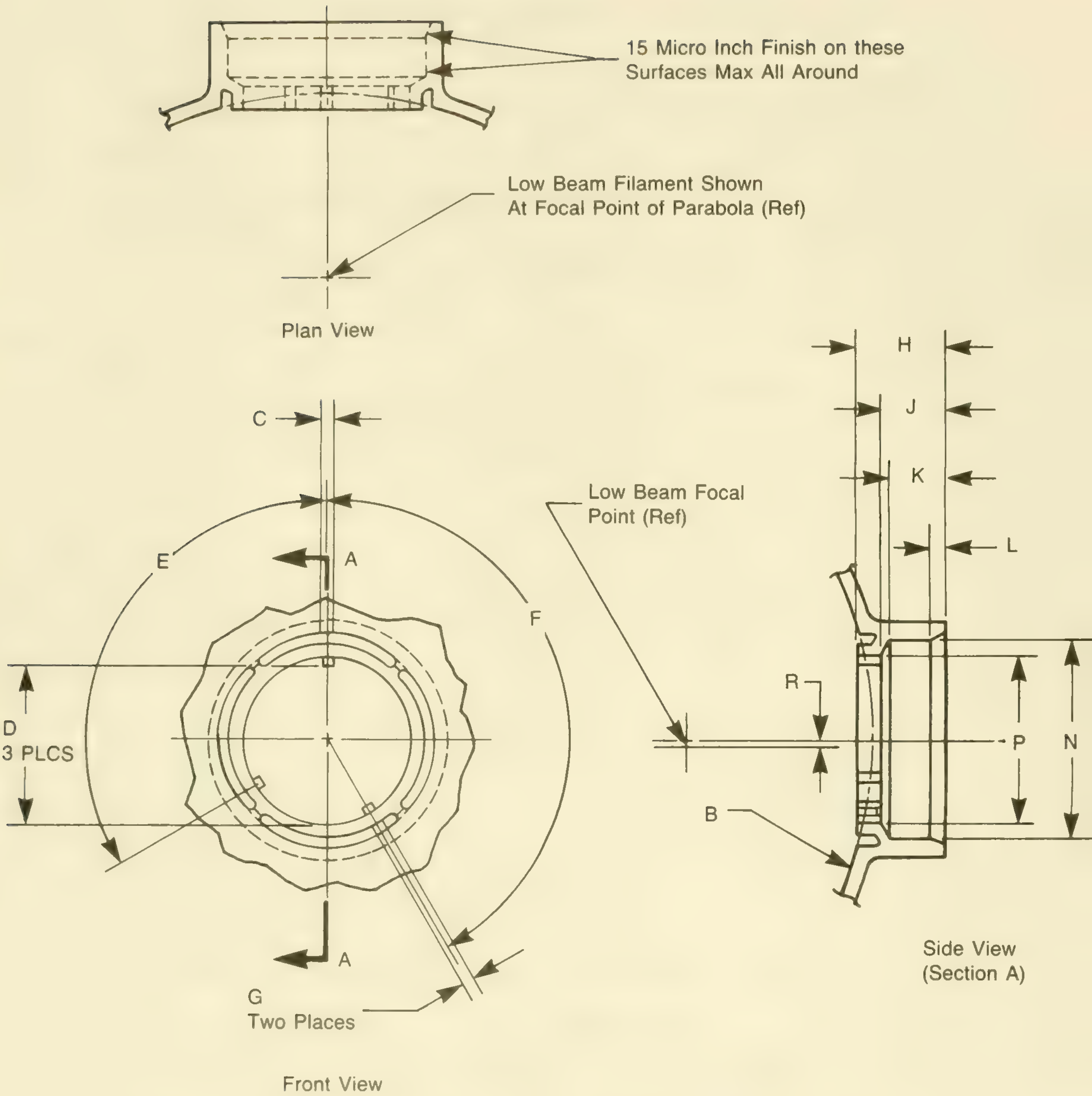


Figure 24-8. - Specification for the HB5 Replaceable Bulb Bulb Holder

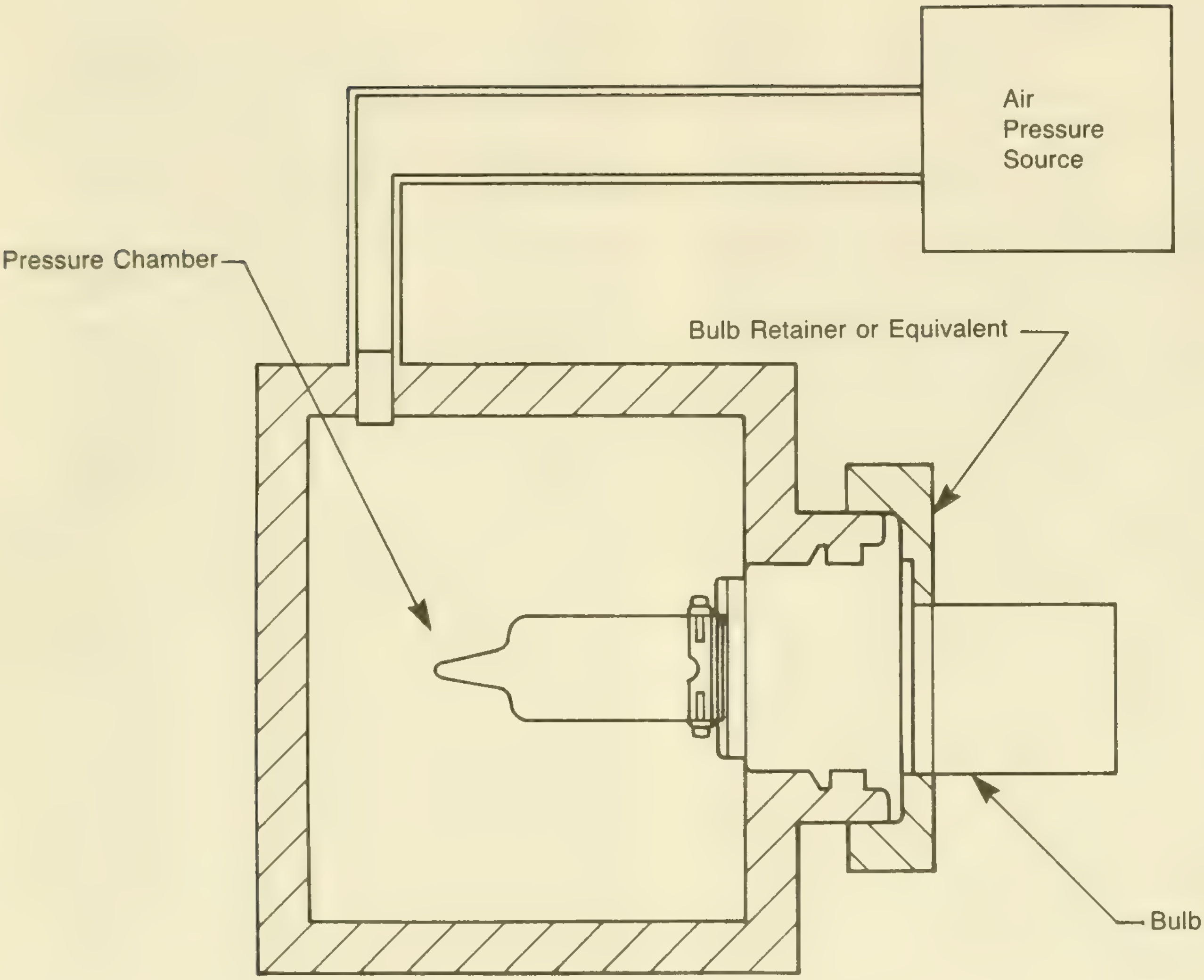
(See reverse page for dimensional specifications)

Dimensional Specifications
Figure 24-8

Dimension	Inches	Millimeters
B	Ref Line Lamp Parabola	Ref Line Lamp Parabola
C	0.079 ± 0.002 0.002 Either Side of CL	2.00 ± 0.05 0.05 Either Side of CL
D	1.067 ± 0.008	27.10 ± 0.20
E	120°	120°
F	150°	150°
G	0.079 ± 0.008	2.00 ± 0.20
H	0.596 ± 0.008	15.15 ± 0.20
J	0.437 ± 0.008	11.10 ± 0.20
K	0.374 ± 0.008	9.50 ± 0.20
L	0.108 ± 0.008	2.75 ± 0.20
N	1.348 + 0.003/− 0.002	34.24 + 0.08/− 0.05
P	1.130 + 0.004/− 0.002 Diameter P shall be concentric to diameter N within ± 0.002	28.70 + 0.10/− 0.05 Diameter P shall be concentric to diameter N within ± 0.05
R	0.015 ± 0.004	0.38 ± 0.10

Tolerance for All Angular
Dimensions ± 1°

Figure 24-9. - Specification for the HB5 Replaceable Bulb Bulb Holder



Bulb Aperture Manufactured to Dimensions as Referenced Below:

Bulb Type	Aperture Diameter Inches	Aperture Diameter Millimeters
HB1, HB5	1.350/1.346	34.3/34.2
HB3	0.796 ± 0.004	20.22 ± 0.10
HB4	0.875 ± 0.004	22.22 ± 0.10

Figure 25. - Pressure Chamber

(See reverse page for dimensional specifications)

Light Source Type	HB1	HB2	HB3	HB4	HB5
HB1	Table I SAE J579 DEC84 (4, 2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	FIg. 15(4) Fig. 17(2)	Table I SAE J579 DEC84 (4, 2)
HB2	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)
HB3	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)
HB4	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)
HB5	Table I SAE J579 DEC84 (4, 2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Fig. 15(4) Fig. 17(2)	Table I SAE J579 DEC84 (4, 2)

Figure 26. - Table of Photometric Requirements for
1. Four-Headlamp Systems (4)
2. Two-Headlamp Systems (2)

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Labeling

(Docket No. 90-02; Notice 2)
RIN 2127-AD22

ACTION: Final Rule.

SUMMARY: This notice implements the petition by the European Tyre and Rim Technical Organisation (E.T.R.T.0.) requesting that NHTSA amend its labeling requirements in Standard No. 109, *New Pneumatic Tires—Passenger Cars* to require a manufacturer to place the required markings between the bead and a point one-half the distance from the bead to the shoulder of the tire, if the tire's maximum section width is close to the bead. This amendment adds to Standard No. 109 a provision previously added by the agency to another tire standard, the one related to tires on vehicles other than passenger cars.

DATES: This amendment is effective November 9, 1990.

SUPPLEMENTARY INFORMATION: Section S4.3 of Standard No. 109, *New Pneumatic Tires—Passenqer Cars* (49 CFR §571.109) sets forth information labeling requirements for tires, including requirements regarding the positioning of the information on the sidewall to ensure that it is readily visible and to minimize the possibility that it will be scuffed off if the sidewall hits a curb or similar object. Until the effective date of this rule, it provides that the information shown in paragraphs S4.3(a) through (g) (e.g., number of plies and inflation pressure) shall appear between the maximum section width and bead. Sections S4.3.1 and S4.3.2 provide more extensive locational requirements for other information (e.g., the DOT certification and the name of the manufacturer or brand name and number assigned to the manufacturer) to be placed on car tires. They provide that the labeling should be done "in the manner specified in Part 574." Part 574, which applies to both car tires and tires for vehicles other than cars, begins in the same manner as S4.3 of Standard No. 109, specifying that the tire identification number shall appear between the maximum section width and bead. However, Part 574 goes on to provide that if a tire's maximum section width falls within one-fourth of the distance from the bead to the tire shoulder, the tire identification number must appear between the bead and a point one half the distance from the bead to the shoulder of the tire. Section S4.3 does not refer to Part 574 or otherwise provide guidance about the placing of the markings required by S4.3(a)—(g) in situations where the tire has its maximum section width close to the bead.

The agency addressed the problem of labeling tires whose maximum section width is close to the bead in a 1985 rulemaking regarding tires for vehicles other than passenger cars. (49 FR 37816, September 26, 1984; 50 FR 10773, March 18, 1985). That rulemaking amended Part 574. Tire Identification and Recordkeeping (49 CFR §574.4) and Standard No. 119, New Pneumatic Tires for Motor Vehicles Other Than Passenger Cars (49 CFR §571.119) to permit placing markings at a different location in order to permit the introduction of a new tire concept for vehicles other than cars where the tire's maximum section width is at the bead. In particular, Figure 1 of Part 574 was amended to specify the requirements for the label's position if a tire's maximum section width falls within one-fourth of the distance from the bead to the tire shoulder. In that case, a marking must appear between the bead and a point one half the distance from the bead to the shoulder of the tire. Amending Part 574 had the practical effect of applying the new requirement to section S4.3.1 and S4.3.2 of Standard No. 109 given that these provisions state that tires must be labeled "in the manner specified in Part 574." However, the 1985 final rule did not amend the labeling requirements for car tires in section S4.3 of Standard No. 109. Nevertheless, the notice did expressly amend section S6.5 of Standard No. 119 to permit this new tire technology.

On June 29, 1989, the European Tyre and Rim Technical Organisation (E.T.R.T.0.) notified NHTSA that a new type of pneumatic tire for passenger cars with its maximum section width close to the bead would not comply with the current requirements in S4.3 of Standard No. 109. As a result, E.T.R.T.0. petitioned the agency to amend section S4.3 to permit labeling on this new type of tire consistent with Figure 1 of Part 574.

After reviewing the petition, the 1985 rulemaking, and the existing regulations NHTSA decided to grant the petition and propose the petitioner's request to expressly include the marking location provisions of

Figure 1 of Part 574 in section S4.3 of Standard No. 109. (55 FR 4445, February 8, 1990) The agency tentatively concluded that amending the standard in this fashion would better address situations in which the maximum section width of passenger car tires is near the bead.

The only commenter to this rulemaking was the petitioner, which requested that the effective date be 30 days after publication of the notice rather than the 180 days proposed in the NPRM. E.T.R.T.0 claimed that an earlier effective date should be permitted given that the proposal is not "major" nor "significant" and does not impose any new requirements. In addition, it stated that the 180 days between the effective date and the publication of the Final Rule would result in considerable delay in the availability of certain vehicles currently in production that are designed to be equipped with the tires relevant to this notice. Thus, it believed that the later effective date would impose an undue burden on both the vehicle and tire manufacturers concerned.

NHTSA has decided to adopt the amendment as proposed, except that it has decided to adopt the earlier effective date suggested by E.T.R.T.0. The agency finds that there is good cause for making this final rule effective in less than 180 days because the amendment permits the production of a new type of passenger car tire that is comparable to currently produced non-passenger car tires. The agency further notes that the amendment will facilitate the marking of labeling information without any foreseeable adverse impact on safety.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

PART 571—[AMENDED]

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403 and 1407; delegation of authority at 49 CFR 1.50.

§ 571.109 [AMENDED]

2. S4.3. of 571.109 is revised to read as follows:

* * * * *

S4.3 Labeling Requirements. Except as provided in S4.3.1 and S4.3.2, each tire shall have permanently molded into or onto both sidewalls, in letters and numerals not less than 0.078 inches high, the information shown in paragraphs S4.3 (a) through (g). On at least one sidewall, the information shall be positioned in an area between the maximum section width and bead of the tire, unless the maximum section width of the tire falls between the bead and one-fourth of the distance from the bead to the shoulder of the tire. For tires where the maximum section width falls in that area, locate all required labeling between the bead and a point one-half the distance from the bead to the shoulder of the tire. However, in no case shall the information be positioned on the tire so that it is obstructed by the flange or any rim designated for use with that tire in Standard Nos. 109 and 110 (§571.109 and §571.110 of this part).

(a) One size designation, except that equivalent inch and metric size designations may be used;

(b) Maximum permissible inflation pressure;

(c) Maximum load rating;

(d) The generic name of each cord material used in the plies (both sidewall and tread area) of the tire;

(e) Actual number of plies in the sidewall, and the actual number of plies in the tread area if different;

(f) The words "tubeless" or "tube type" as applicable; and

(g) The word "radial" if the tire is a radial ply tire.

* * * * *

Issued on: October 3, 1990.

Jeffrey R. Miller
Deputy Administrator

55 F.R. 41190
October 10, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires for Passenger Cars—CT Tires

(Docket No. 90-04; Notice 2)
RIN 2127-AD21

ACTION: Final Rule

SUMMARY: This notice amends Standard No. 109, *New Pneumatic Tires*, to permit passenger car tires with a maximum inflation pressure of 290, 330, 350, or 390 kPa, in response to a petition to allow the "CT" tire and rim (an inverted flange tire and rim system). The tire has run-flat capability. After evaluating the petition and comments to the proposal, NHTSA has concluded that the CT tire has the potential for increased safety, especially in the deflated condition, and may result in incidental benefits such as increased fuel efficiency. Conforming amendments have been made throughout Standard No. 109 and the Uniform Tire Quality Grading Standards to establish criteria suitable for tires with the new pressures.

DATES: Effective date: The final rule is effective on December 31, 1990.

SUPPLEMENTARY INFORMATION:

Background

Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires*, (49 CFR §571.109) specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength, tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

Until the effective date of the amendments adopted in this rule, Standard No. 109 requires passenger car tires to have a maximum inflation pressure of either 32, 36, 40, or 60 psi (pounds per square inch), or 240, 280, 300, or 340 kPa (kiloPascals). These maximum inflation pressures are incorporated in Table I-C "Radial Ply Tires" and Table II, "Test Inflation Pressures," which are in Appendix A. In addition, Figure 1 specifies wheel sizes for tires relative to the tubeless tire bead unseating resistance tests in section S5.2.1. The Uniform Tire Quality Grading Standards ("UTQGS" at 49 CFR 575.104) sets forth similar requirements for maximum permissible inflation pressures for the testing procedures in Table 1, Table 2, and Table 2A.

A new pneumatic passenger car tire must comply with requirements for bead unseating, tire strength, tire endurance, and high speed endurance at a maximum permissible inflation pressure specified in Standard 109. The agency specifies a limited number of permissible maximum inflation pressures (or wheel sizes, in the case of the bead unseating test) to facilitate compliance testing.

On March 8, 1989, Continental AG. Daimler-Benz, and General Tire Inc. petitioned the agency to amend Standard No. 109 and the UTQGS to permit the use of a new tire and rim concept known as the "CT" tire. With this tire, the rim flanges point radially inward and the tire fits on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire. The amendments were necessary because the CT tire is usable only at maximum inflation pressures that were not specified in Standard No. 109. Accordingly, the petitioners requested the agency to amend the standard to include four new maximum inflation pressures—290, 330, 350, and 390 kPa. The petitioners stated that amending Standard No. 109 to permit the CT tire would result in an increased level of safety compared to conventional radial tires in cases of flats, significant under-inflation from gradual air loss, or blowouts from sudden air loss. They stated that unlike a conventional tire, a CT tire with a flat may still be driven safely at normal highway speeds for up to 200 miles. A driver therefore could travel to a service station instead of changing the flat tire in a dangerous or inconvenient setting. They also stated that unlike a conventional tire, a CT tire that is under-inflated or experiences sudden air loss would not result in any appreciable loss of control because the tire would not leave the rim. The petitioners stated that the requested amendment would result in incidental benefits, including allowing a vehicle to have larger brake, suspension, and anti-lock brake systems, shorter stopping distances, greater resistance to hydroplaning, better distribution of the tire footprint pressure, and increased fuel savings by reducing the overall vehicle weight. The petitioner's test and other data on the performance of the CT tire indicated that the tire, when

properly inflated, would comply with Standard No. 109's performance requirements. They also tested the CT tire while in its deflated stage to determine whether the tire would leave the rim or come apart when driven through various maneuvers.

On February 14, 1990, the agency issued a notice of proposed rulemaking (NPRM) proposing to amend Standard No. 109 to include additional maximum inflation pressures for pneumatic tires on passenger cars (55 FR 5237). The NPRM summarized previous rulemakings in which the agency amended Standard No. 109 to permit additional maximum inflation pressures. (See 53 FR 17950, May 19, 1988, 53 FR 936, January 14, 1988; and (43 FR 8570, March 2, 1978; 43 FR 24310, June 5, 1978). In those earlier rulemakings, the agency determined that amending the standard's specifications for the maximum permissible inflation pressure was necessary to permit a new tire technology to carry a load comparable to that carried by tires already in compliance with the standard.

NHTSA decided to propose amending Standard No. 109 to permit tires with maximum inflation pressures of 290, 330, 350, or 390 kPa, after tentatively concluding that the CT tire had the potential for increased safety, especially in the deflated condition. The agency also tentatively concluded that allowing the CT tire might result in incidental benefits such as increased fuel efficiency. The notice proposed conforming amendments to Standard No. 109 and the Uniform Tire Quality Grading Standards (49 CFR 575.104) to establish test criteria suitable for tires with the new maximum inflation pressures.

NHTSA received comments from ETRTO, the Rubber Manufacturers Association (RMA), and five tire or motor vehicle manufacturers. All commenters favored the proposal. The agency therefore is adopting the proposed amendments for the reasons set forth in the NPRM.

In response to technical comments, the agency is modifying certain provisions in its UTQGS regulations relative to the inclusion of CT tires. NHTSA agrees with the petitioner's comment that the proposal's headings in Tables 1 and 2 of 49 CFR 575.104 do not best reflect temperature resistance testing under the UTQGS. The final rule therefore adopts more appropriate wording suggested in the petitioner's comments. The final rule also includes certain treadwear and traction testing multipliers to Table 2, which were inadvertently omitted in the NPRM.

The agency agrees with RMA's comment that the agency should not include the phrase "or equivalent" to 575.104(e)(2)(i) given that the tires on any one vehicle should be of the same size designation and that the additional phrase would have added imprecision to UTQGS.

The agency has decided not to adopt RMA's request to amend 575.104(f)(2)(B) rather than (f)(2)(D)(viii) (sic) because the CT tire inflation pressures are for candidate tires subject to 575.104 (f)(2)(viii); while (f)(2)(B) refers to standard test tires.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. The agency has concluded that there is "good cause" not to provide the full 180 day lead-in period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers. In addition, the public interest will be served by not delaying the introduction of tires that can provide better performance without having any negative impact on safety. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, 49 CFR Part 571 and 575 is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

(*Authority*: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50)

571.109 [AMENDED]

2. Section S3 is amended by adding the following definition after the definition for "Cracking":

* * * *

"CT" means a pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

* * * *

3. Section S4.2.1(b) is revised to read as follows:

* * * *

(b) Its maximum permissible inflation pressure shall be either 32, 36, 40, or 60 psi, or 240, 280, 300, 340 kPa. For a CT tire the maximum permissible inflation pressure shall be either 290, 330, 350, or 390 kPa.

* * * *

4. S4.2.2.2(2) is revised to read as follows:

* * * *

(2) (For tires with a maximum permissible inflation pressure of 60 psi, or 240, 280, 290, 300, 330, 340, 350, or 390 kPa) 7 percent or 0.4 inch, whichever is larger.

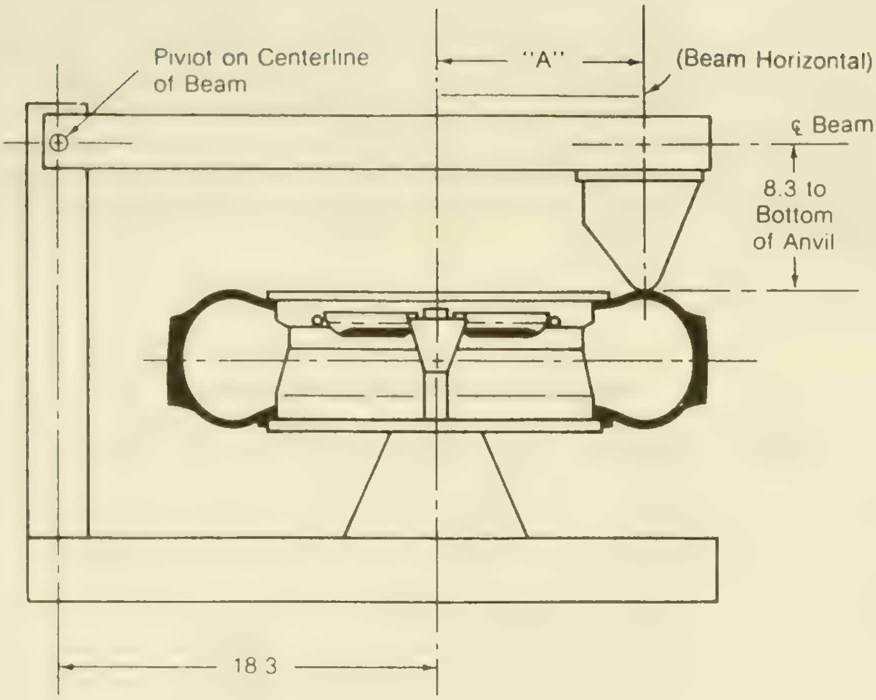
* * * *

5. Section S4.3.4 is revised to read as follows:

* * * *

S4.3.4 If the maximum inflation pressure of a tire is 240, 280, 290, 300, 330, 340, 350, or 390 kPa, then:

(a) Each marking of that inflation pressure pursuant to S4.3(b) shall be followed in parenthesis by the



Wheel Size	*Dimension "A" for tires with maximum inflation pressure*	
	Other than 60 lbs/in²	*60 lbs/in²*
17	12.00	....
16	11.50	9.90
15	11.00	9.40
14	10.50	8.90
13	10.00	8.40
12	9.50	....
11	9.00	....
10	8.50	....
320	8.50	....
340	9.00	....
345	9.25	....
365	9.75	....
370	10.00	....
390	11.00	....
415	11.50	....
400(1)	10.25	....
425(1)	10.75	....
450(1)	11.25	....
475(1)	11.75	....
500(1)	12.25	....

(1) for CT tires only

Figure 1—Bead Unseating Fixture—Dimensions in Inches

Table I-C.—For Radial Ply Tires

Size Designation	*Maximum permissible inflation*										
	32 lbs/in²	*36 lbs/in²*	*40 lbs/in²*	*240 kPa*	*280 kPa*	*300 kPa*	*340 kPa*	*(1) 290 kPa*	*(1) 330 kPa*	*(1) 350 kPa*	*(1) 390 kPa*
Below 160 mm (in-lbs)	1,950	2,925	3,900	1,950	3,900	1,950	3,900	1,950	3,900	1,950	3,900
160 mm or above (in-lbs)	2,600	3,900	5,200	2,600	5,200	2,600	5,200	2,600	5,200	2,600	5,200

(1) For CT tires only

Table II.—Test Inflation Pressures

Maximum permissible inflation pressure to be used for the following test:												
Test Type	*lbs/in²*				*kPa*				*kPa (1)*			
	32	*36*	*40*	*60*	*240*	*280*	*300*	*340*	*290*	*330*	*350*	*390*
Physical dimensions, bead unseating, tire strength, and tire endurance	24	28	32	52	180	220	180	220	230	270	230	270
High speed performance	30	34	38	58	220	260	220	260	270	310	270	310

(1) For CT tires only

Table 1.—Test Inflation Pressures

Test Type	*Maximum permissible inflation pressure for the following test:* lbs/in²				kPa				kPa (1)			
	32	*36*	*40*	*60*	*240*	*280*	*300*	*340*	*290*	*330*	*350*	*390*
Treadwear test	24	28	32	52	180	220	180	220	230	270	230	270
Temperature resistance test	30	34	38	58	220	260	220	260	270	310	270	310

(1) For CT tires only

Table 2 [1]

Maximum Inflation Pressure	*Multiplier to be used for treadwear testing*	*Multiplier to be used for traction testing*
32 lbs/in²	.851	.851
36 lbs/in²	.870	.797
40 lbs/in²	.883	.753
240 kPa	.866	.866
280 kPa	.887	.804
300 kPa	.866	.866
340 kPa	.887	.804
290 kPa (1) . . .	.866	.866
330 kPa (1) . . .	.887	.804
350 kPa (1) . . .	.866	.866
390 kPa (1) . . .	.887	.804

(1) For CT tires only

[1] Prior to July 1, 1984, the multipliers in the above table are not to be used in determining loads for the tire size designations listed below in Table 2A. For those designations, the load specifications in that table shall be used in UTQG testing during that period. These loads are the actual loads at which testing shall be conducted and should not be multiplied by the 85 percent factors specified for treadwear and traction testing.

equivalent inflation pressure in psi, rounded to the next higher whole number; and

(b) Each marking of the tire's maximum load rating pursuant to S4.3(c) in kilograms shall be followed in parenthesis by the equivalent load rating in pounds, rounded to the nearest whole number.

* * * *

6. The revised table of wheel sizes and test fixture dimensions in Figure 1 follows.

7. Revised Table I–C of Appendix A follows.

8. Revised Table II of Appendix A follows.

PART 575 [AMENDED]

9. The authority citation for part 575 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1407, 1421, and 1423; delegation of authority at 49 CFR 1.50.

10. A new sentence is added to 575.104(f)(2)(viii) immediately after the first sentence. The first sentence is being republished for the convenience of the reader.

* * * *

(f) * * * *

(2)* * * *

(viii) Prepare two candidate tires of the same construction type, manufacturer, line, and size designation in accordance with paragraph (f)(2)(i) of this section, mount them on the test apparatus, and test one of them according to the procedures of paragraph (f)(2)(ii) through (v) of this section, except load each tire to 85 percent of the test load specified in 575 104(h). For CT tires, the test inflation of candidate tires shall be 230 kPa.

11. Revised Table 1 of Part 575 follows.

12. Revised Table 2 of Part 575 follows.

Issued on: November 9, 1990.

Jeffrey R. Miller
Deputy Administrator

55 F.R. 49618
November 30, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

Pneumatic Tires—Bead Unseating Tire Dimensions
(Docket No. 90-10; Notice 2)
RIN 2127-AD36

ACTION: Final Rule.

SUMMARY: This notice takes final action on a petition by the Rubber Manufacturers Association to amend Standard No. 109, *New Pneumatic Tires—Passenger Cars,* to permit the testing of 17 and 18 inch T-Type temporary spare tires. Prior to this amendment, the dimensions set forth in the table in Figure 1 for bead unseating did not permit tires of these sizes.

DATES: *Effective date*: These amendments are effective March 18, 1991.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires,* (49 CFR 571.109) contains performance requirements and tests for pneumatic tires for passenger cars, including specifications for bead unseating resistance in S4.2.2.3 and S5.2. In preparation for the test, the tire to be tested must be washed, dired, and inflated to an inflation pressure specified in Table II of the standard. Then, after mounting the wheel and tire in a fixture described in Figure 1 of the standard, a load must be applied through a testing block until the bead unseats or the specified value is reached.

A table in Figure 1 specifies dimensions of the bead unseating fixture for various wheel sizes. Among the dimensions is "dimension A for tires with maximum inflation pressure." "Dimension A" is a subsection of the bead unseating fixture for the center of mounted wheel and tire combination to the point at which the test anvil contacts the tire at the beginning of the bead unseating test. The point of contact is the maximum section width of a properly inflated tire. The permissible wheel sizes are currently 10 inches to 17 inches, at one inch intervals.

The Rubber Manufacturers Association (RMA) petitioned the agency to amend the permissible dimensions in the bead unseating fixture specified in the table in Figure 1. It requested that in Figure 1, the table include "dimension A's" of 10.6 inches for 17 inch tires and 11.4 inches for 18 inch tires having maximum inflation pressure of 60 lb./in^2. The petition stated that new "dimension A's" were needed for 17 and 18 inch T-Type tires which had been standardized by the Tire and Rim Association.

After its initial review, the agency granted the petition and issued a notice of proposed rulemaking (NPRM) to amend the table in Figure 1 in Standard, No. 109. (55 FR 24280, June 15, 1990). The agency tentatively concluded in the proposal that the requested amendment would permit the introduction of 17 and 18 inch T-Type tires, for which Standard No. 109 did not contain provisions. The notice explained that when the agency initially amended the standard to permit T-Type tires, only tires with diameters of 13 inches to 16 inches where anticipated. (44 FR 12869, March 7, 1977).

The notice continued that the "A values" in Figure 1 were uniformly derived from a formula which added a constant value of 1.9 inches after the wheel size was divided by two. Applying the formula to the proposed 17 and 18 inch tires results in values of 10.4 inches for 17 inch wheels and 10.9 inches for 18 inch wheels. In contrast, RMA recommended values of 10.6 inches and 11.4 inches, stating that these larger values would allow tires to be tested without having the test anvil come into contact with the rim during a bead unseating test. The notice proposed these larger values, which the agency tentatively concluded would more appropriately test 17 and 18 inch T-Type tires. The NPRM requested comments about the need to amend the wheel sizes in the table in Figure 1 and the appropriateness of the proposed values.

In response to the NPRM, the agency received comments from the European Tyre and Rim Technical Organisation (ETROT) and General Motors (GM). Both commenters supported the proposal's intent. No comment opposed the proposal. NHTSA has considered the points by the commenters in developing this final rule. The commenter's significant points are addressed below, along with the agency's response to those points.

Along with supporting the proposal to adding testing dimensions, for 17 and 18 inch T-Type tires to the table in Figure 1, the commenters expressed additional thoughts. ETRTO requested amending the table

to include additional "dimension A's" for 18 inch conventional tires and 19 inch T-Type tires. GM suggested that the agency amend Standard No. 109 by eliminating the table in Figure 1 and replacing it with a uniform formula for calculating "dimension A." Their recommended formula would be the distance between the center of the wheel to the point of maximum section width of the inflated tire mounted in the bead unseating fixture in Figure 1. GM believed that specifying this formula instead of specific numerical values for each wheel diameter would eliminate the need to amend the standard each time a tire with a new wheel diameter was introduced. It suggested that a footnote could be added to Figure 1 stating that manufacturers could increase of decrease the value for "dimension A" in specified increments if the bead unseating test could not be completed due to testing difficulties. GM further stated that to facilitate NHTSA's enforcement testing, the angency could require tire manufacturers to provide that value for "dimension A" used for its certification before conducting the bead unseating test.

Based on the reasons in the NPRM and the commenters' general agreement with the proposal, NHTSA has decided to amend the table in Figure 1 of Standard No. 109, as proposed. Accordingly, the table in Figure 1 is amended to include new "dimension A's" for 17 and 18 inch T-Type tires.

NHTSA is currently evaluating the merits of the commenters' additional recommendations about testing for bead unseating. If the agency determines that these recommendations are worthwhile, it will issue an NPRM initiating a rulemaking.

Section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. Given that this amendment facilitates the introduction of certain tires without imposing additional requirements on manufacturers and that the public interest is served by not delaying the introduction of these alternative tire designs, the agency has determined that there is good cause to have the amendment become effective 30 days after publication of the final rule.

In § 571-109, the Table in Figure 1 is revised to read as follows:

Wheel Size	*Dimension "A" for tires with maximum inflation pressure*	
	Other than 60 lbs/in²	*60 lbs/in²*
18		11.40
17	12.00	10.60
16	11.50	9.90
15	11.00	9.40
14	10.50	8.90
13	10.00	8.40
12	9.50	
11	9.00	
10	8.50	
320mm	8.50	
340mm	9.00	
345mm	9.25	
365mm	9.75	
370mm	10.00	
390mm	11.00	
415mm	11.50	
400mm(1)	10.25	
425mm(1)	10.75	
450mm(1)	11.25	
475mm(1)	11.75	
500mm(1)	12.25	

(1) for CT tires only

Figure 1—
Bead Unseating Fixture—Dimensions in Inches

Issued on: February 11, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 6288
February 15, 1991

MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

S1. Scope. This standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance, and high-speed performance; defines tire load ratings; and specifies labeling requirements for passenger car tires.

S2. Application. This standard applies to new pneumatic tires for use on passenger cars manufactured after 1948. However, it does not apply to any tire which has been altered so as to render impossible its use, or its repair for use, as motor vehicle equipment.

S3. Definitions. "Bead" means that part of the tire made of steel wires, wrapped or reinforced by ply cords, that is shaped to fit the rim.

"Bead separation" means a breakdown of bond between components in the bead area.

"Bias ply tire" means a pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90° to the centerline of the tread.

"Carcass" means the tire structure, except tread and sidewall rubber.

"Chunking" means the breaking away of pieces of the tread or sidewall.

"Cord" means the strands forming the plies in the tire.

"Cord separation" means cord parting away from adjacent rubber compounds.

"Cracking" means any parting within the tread, sidewall, or innerliner of the tire extending to cord material.

[“CT" means a pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire. **(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)**]

"Groove" means the space between two adjacent tread ribs.

"Innerliner" means the layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

"Innerliner separation" means the parting of the innerliner from cord material in the carcass.

"Load rating" means the maximum load a tire is rated to carry for a given inflation pressure.

"Maximum permissible inflation pressure" means the maximum cold inflation pressure to which a tire may be inflated.

"Maximum load rating" means the load rating at the maximum permissible inflation pressure for that tire.

"Open splice" means any parting at any junction of tread, sidewalls, or innerliner that extends to cord material.

"Overall width" means the linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

"Ply" means a layer of rubber-coated parallel cords.

"Ply separation" means a parting or rubber compound between adjacent plies.

"Pneumatic tire" means a mechanical device made of rubber, chemicals, fabric and steel or other materials, which, when mounted on an automative wheel, provides the traction and contains the gas or fluid that sustains the load.

"Radial ply tire" means a pneumatic tire in which the ply cords which extend to the beads are laid at substantially 90° to the centerline of the tread.

"Rim" means a metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

"Section width" means the linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

"Sidewall" means that portion of a tire between the tread and the bead.

"Sidewall separation" means the parting of the rubber compound from the cord material in the sidewall.

"Test rim" means, with reference to a tire to be tested, any rim that is listed as appropriate for use with that tire in accordance with S4.4. For purposes of this section and § 571.110 of this chapter, each rim listing shall include dimensional specifications and a diagram of the rim.

"Tread" means that portion of a tire that comes into contact with the road.

"Tread rib" means a tread section running circumferentially around a tire.

"Tread separation" means pulling away of the tread from the tire carcass.

S4. Requirements.

S4.1 Size and Construction. Each tire shall be designed to fit each rim specified for its size designation in each reference cited in the definition of "test rim" in S.3.

S4.2 Performance requirements.

S4.2.1 General. Each tire shall conform to each of the following:

(a) It shall meet the requirements specified in S4.2.2 for its tire size designation, type, and maximum permissible inflation pressure.

(b) Its maximum permissible inflation pressure shall be either 32, 36, 40, or 60 psi, or 240, 280, 300, or 340 kPa. [For a CT tire the maximum permissible inflation pressure shall be either 290, 330, 350, or 390 kPa. **(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)**]

(c) Its load rating shall be that specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for its size designation, type and each appropriate inflation pressure. If the maximum load rating for a particular tire size is shown in more than one of the publications described in S4.4.1(b), each tire or that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing maximum load ratings for the same tire size designation, not less than the lowest published maximum load rating.

(d) If manufactured on or after August 1, 1968, it shall incorporate a tread wear indicator that will provide a visual indication that the tire has worn to a tread depth of $\frac{1}{16}$ inch.

(e) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high-speed performance test procedure specified in S5.5, exhibit no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking or open splices.

(f) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 other tires.

S4.2.2 Test requirements.

S4.2.2.1 Test sample. For each test sample use—

(a) One tire for physical dimensions, resistance to bead unseating, and strength, in sequence;

(b) Another tire for tire endurance; and

(c) A third tire for high-speed performance.

S4.2.2.2 Physical Dimensions. The actual section width and overall width for each tire measured in accordance with S5.1, shall not exceed the section width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a) or in one of the publications described in S4.4.1(b) for its size designation and type by more than:

(1) (For tires with a maximum permissible inflation pressure of 32, 36, or 40 psi) 7 percent, or

(2) [(For tires with a maximum permissible inflation pressure of 60 psi or 240, 280, 290, 300, 330, 340, 350, or 390 kPa) 7 percent or 0.4 inch, whichever is larger. **(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)**]

Its size factor shall be at least as large as that specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for its size designation and type.

S4.2.2.3 Tubeless tire resistance to bead unseating.

S4.2.2.3.1 When a tubeless tire that has a maximum inflation pressure other than 60 psi is tested in accordance with S5.2, the applied force required to unseat the tire bead at the point of contact shall be not less than:

(a) 1500 pounds for tires with a designated section width of less than six (6) inches;

(b) 2000 pounds for tires with a designated section width of six (6) inches or more, but less than eight (8) inches;

(c) 2,500 pounds for tires with a designated section width of eight (8) inches or more, using the section width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for the applicable tire size designation and type.

S4.2.2.3.2 When a tire that has a maximum inflation pressure of 60 psi is tested in accordance with S5.2, the applied force required to unseat the tire bead at the point of contact shall be not less than:

(a) 1500 pounds for tires with a maximum load rating of less than 880 pounds;

(b) 2000 pounds for tires with a maximum load rating of 880 pounds or more but less than 1400 pounds;

(c) 2,500 pounds for tires with a maximum load rating of 1,400 pounds or more, using the maximum load rating marked on the sidewall of the tire.

S4.2.2.4 Tire strength. Each tire shall meet the requirements for minimum breaking energy specified in Table I when tested in accordance with S5.3.

S4.2.2.5 Tire endurance. When the tire has been subjected to the laboratory endurance test specified in S5.4, using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressure specified in S5.4.1.1.

S4.2.2.6 High-speed performance. When the tire has been subjected to the laboratory high-speed performance test specified in S5.5, using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber, the tire shall meet the requirements set forth in S4.2.2.5(a) and (b).

S4.3 Labeling requirements. Except as provided in S4.3.1 and S4.3.2 each tire shall have permanently molded into or onto both sidewalls, in letters and numerals not less than 0.078 inches high, [the information shown in paragraphs S4.3 (a) through (g). On at least one sidewall, the information shall be positioned in an area between the maximum section width and bead of the tire, unless the maximum section width of the tire falls between the bead and one-fourth of the distance from the bead to the shoulder of the tire. For tires where the maximum section width falls in that area, locate all required labeling between the bead and a point one-half the distance from the bead to the shoulder of the tire. However, in no case shall the information be positioned on the tire so that it is obstructed by the flange or any rim designated for use with that tire in Standard Nos. 109 and 110 (§ 571.109 and § 571.110 of this part). **(55 F.R. 41190—October 10, 1990. Effective: November 9, 1990)]**

(a) One size designation, except that equivalent inch and metric size designations may be used;

(b) Maximum permissible inflation pressure;

(c) Maximum load rating;

(d) The generic name of each cord material used in the plies (both sidewall and tread area) of the tire;

(e) Actual number of plies in the sidewall, and the actual number of plies in the tread area if different;

(f) The words "tubeless" or "tube type" as applicable; and

(g) The word "radial" if the tire is a radial ply tire.

S4.3.1 Each tire shall be labeled with the symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards.

S4.3.2 Each tire shall be labeled with the name of the manufacturer, or brand name and number assigned to the manufacturer in the manner specified in Part 574.

S4.3.3 Each tire manufactured between March 1, 1971, and May 22, 1971, shall either—

(a) Comply with S4.3(d)(2) and S4.3(i) (as effective until May 22, 1971); or

(b) Be labeled with the tire identification number required by Part 574.5 of this chapter and comply with S4.3.1 and S4.3.2 (as effective on and after May 22, 1971).

S4.3.4 [If the maximum inflation pressure of a tire is 240, 280, 290, 300, 330, 340, 350, or 390 kPa, then: **(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)]**

(a) Each marking of that inflation pressure pursuant to S4.3(b) shall be followed in parenthesis by the equivalent inflation pressure in psi, rounded to the next higher whole number; and

(b) Each marking of the tire's maximum load rating pursuant to S4.3(c) in kilograms shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole number.

S4.3.5 If the maximum inflation pressure of a tire is 60 psi, the tire shall have permanently molded into or onto both sidewalls, in letters and numerals not less than ½ inch high, the words "Inflate to 60 psi." On both sidewalls, the words shall be positioned in an area between the tire shoulder and the bead of the tire. However, in no case shall the words be positioned on the tire so that they are obstructed by the flange of any rim designated for use with that tire in this standard or in Standard No. 110 (§ 571.110 of this part).

S4.4 Tire and rim matching information.

S4.4.1 Each manufacturer of tires shall ensure that a listing of the rims that may be used with each tire that he produces is provided to the public. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or diagram of a rim if the rim's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b). The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture or any later date, of at least one of the following organizations:

The Tire and Rim Association.
The European Tyre and Rim Technical Organisation.
Japan Automobile Tire Manufacturers' Association, Inc.
Deutsche Industrie Norm.
British Standards Institution.
Scandinavian Tire and Rim Organization.
The Tyre and Rim Association of Australia.

S4.4.2 Information contained in any publication specified in S4.4.1(b) which lists general categories of tires and rims by size designation, type of construction and/or intended use, shall be considered to be manufacturer's information pursuant to S4.4.1 for the listed tires and rims, unless the publication itself or specific information provided according to S4.4.1(a) indicates otherwise.

S5 Test procedures.

S5.1 Physical Dimensions. Determine tire physical dimensions under uniform ambient conditions as follows:

(a) Mount the tire on a test rim having the test rim width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for that tire size designation and inflate it to the applicable pressure specified in Table II.

(b) Condition it at ambient room temperature for at least 24 hours.

(c) Readjust pressure to that specified in (a).

(d) Caliper the section width and overall width at six points approximately equally spaced around the tire circumference.

(e) Record the average of these measurements as the section width and overall width, respectively.

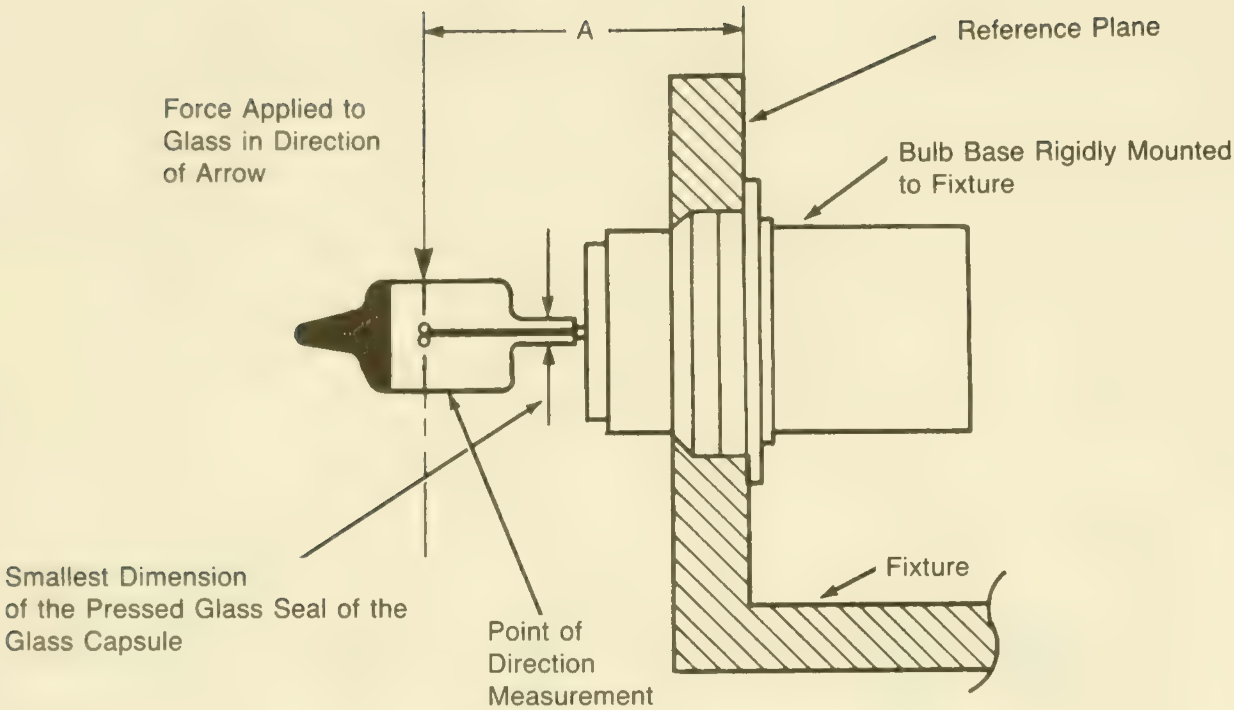
(f) Determine tire outer diameter by measuring the maximum circumference of the tire and dividing this dimension by pi (3.14).

S5.2 Tubeless tire bead unseating resistance.

S5.2.1 Preparation of tire-wheel assembly.

S5.2.1.1 Wash the tire, dry it at the beads, and mount it without lubrication or adhesives on a clean, painted test rim.

S5.2.1.2 Inflate it to the applicable pressure specified in Table II at ambient room temperature.



Standardized Replaceable Light Source Type	Dimesion "A".
HB1	44.50 ± 0.38 mm (1.75 ± 0.015 in)
HB2	31.25 ± 0.40 mm (1.23 ± 0.012 in)
HB3	31.50 ± 0.20 mm (1.24 ± 0.008 in)
HB4	31.50 ± 0.20 mm (1.24 ± 0.008 in)
[HB5	44.50 ± 0.25 mm (1.75 ± 0.010 in)] *

* **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)**

Figure 8. - Bulb Deflection Test

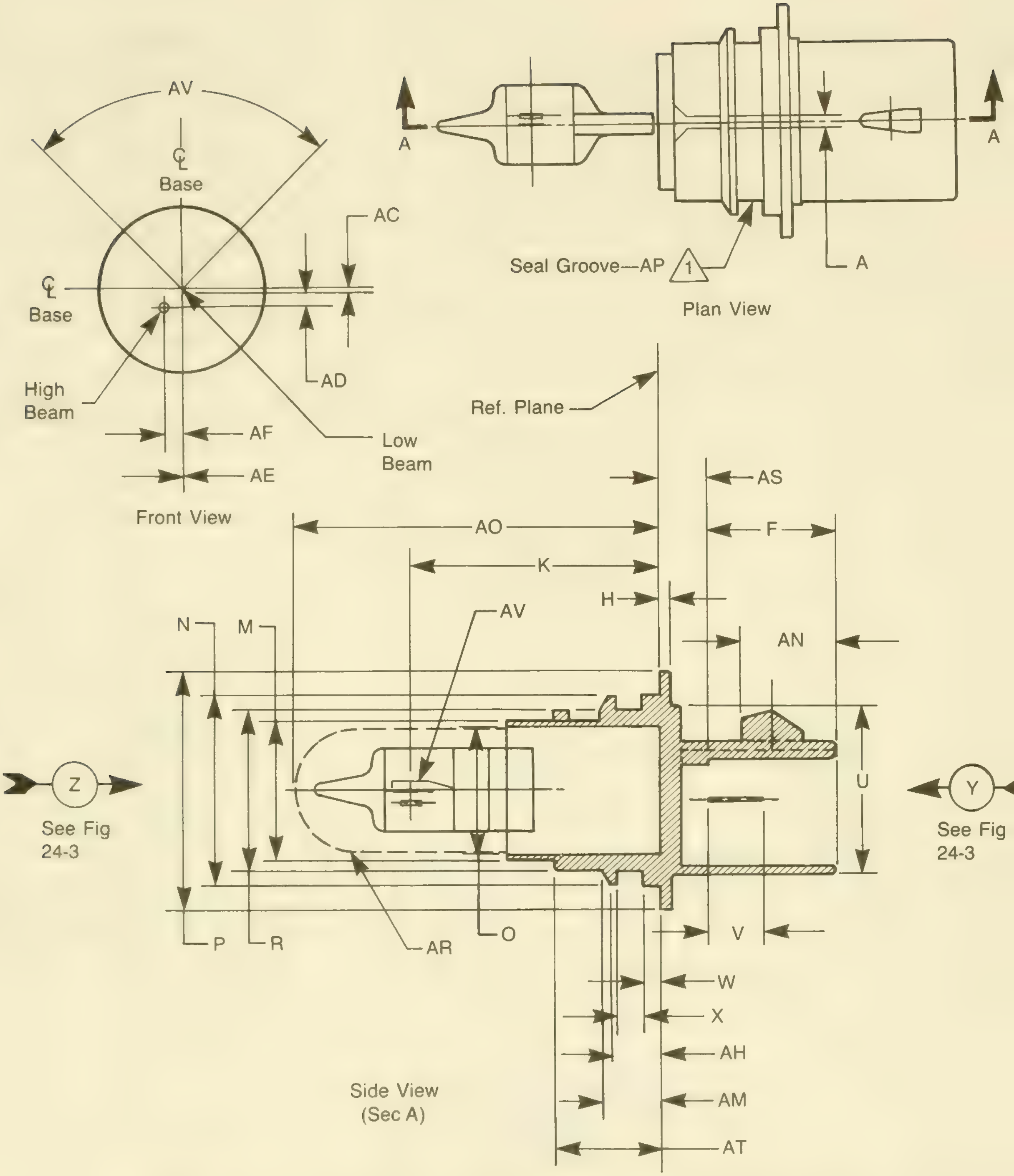


Figure 24-1. - Specification for the HB5 Replaceable Bulb

(See reverse page for dimensional specificatio

Dimensional Specifications
Figure 24-1

Dimension	Inches	Millimeters
A	(0.085/0.083) 0.002 Either Side CL	(2.15/2.10) 0.05 Either Side CL
F	0.906 ± 0.008	23.00 ± 0.20
H	0.079 ± 0.004	2.00 ± 0.20
K Low Beam	1.752 ± 0.010	44.50 ± 0.25
High Beam	CL High Beam to be within ± 0.025 of CL of low beam	CL High Beam to be within ± 0.64 of CL of low beam
M	0.978 Max.	24.85 Max.
N	(1.335/1.331) 0.002 Either Side CL	(33.90/33.80) 0.05 Either Side CL
O	0.965 Max.	24.5 Max.
P	1.673 ± 0.008	42.50 ± 0.20
R	(1.126/1.122) 0.002 Either Side CL	(28.60/28.50) 0.05 Either Side CL
U	1.181 ± 0.008	30.00 ± 0.20
V	0.413 ± 0.020	10.50 ± 0.50
W	0.128 ± 0.008	3.25 ± 0.20
X	0.189 ± 0.008	4.80 ± 0.20
AC	0.015 ± 0.015	0.38 ± 0.38
AD	0.063 ± 0.025	1.60 ± 0.64
AE	0.000 ± 0.015	0.000 ± 0.38
AF	0.063 ± 0.032	1.60 ± 0.81
AH	0.356 ± 0.008	9.05 ± 0.20
AM	0.415 ± 0.008	10.54 ± 0.20
AN	0.673 ± 0.008	17.10 ± 0.20
AO	2.756 Max.	70.0 Max.
AP	Seal must withstand a minimum of 70 kPa (10 PSIG) when bulb-seal assembly is inserted into a cylindrical aperture of 34.3/34.2 mm (1.350/1.346 in).	
AR	Glass capsule and supports shall not exceed this envelope.	
AS	0.335 ± 0.079	8.5 ± 2.0
AT	0.665 ± 0.035	16.9 ± 0.90
AV	Support wires extending forward of the filaments shall be within ± 45° of vertical.	

△1 Bulb must be equipped with a seal

Figure 24-2. - Specification for the HB5 Replaceable Bulb

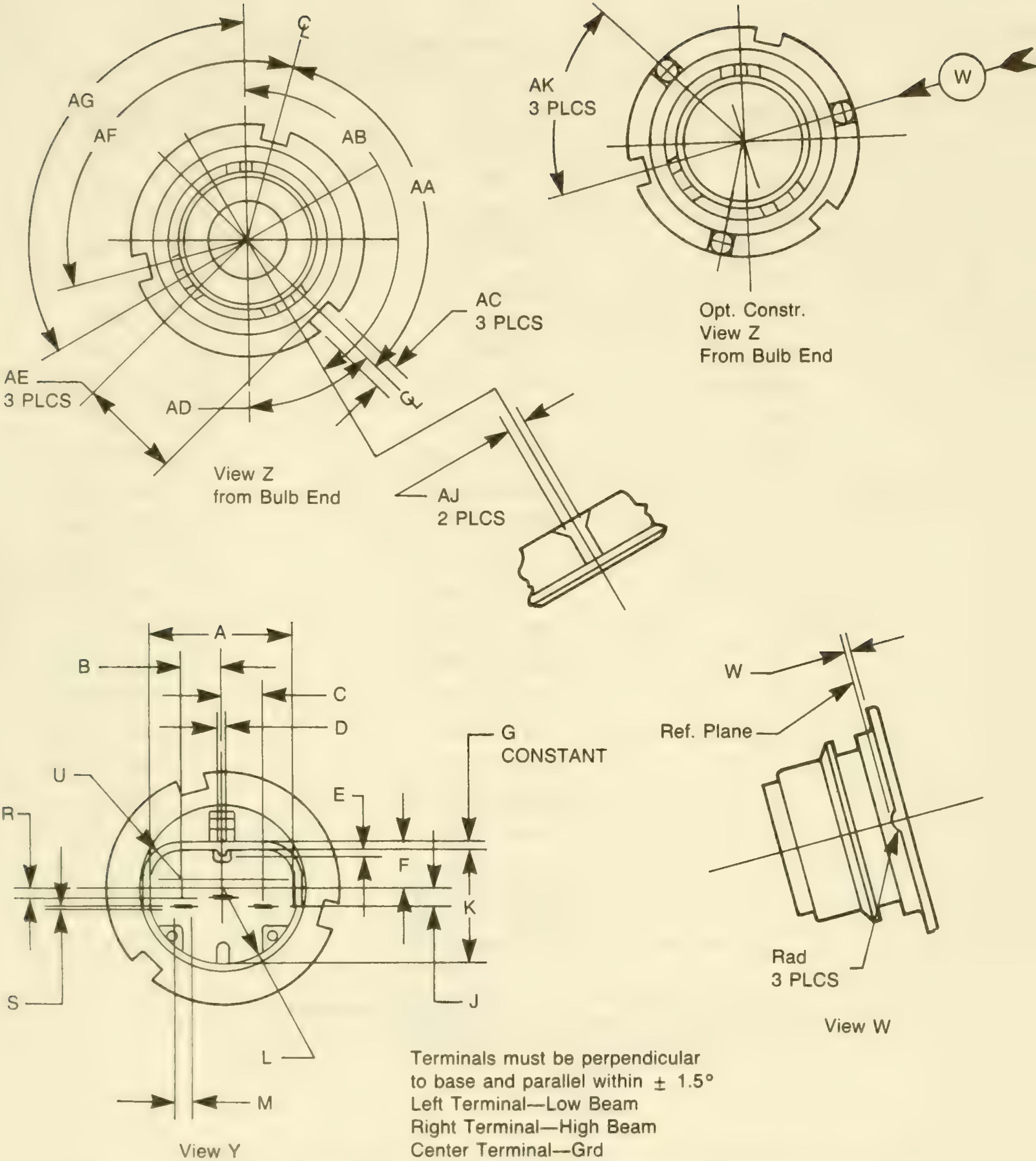


Figure 24-3. - Specification for the HB5 Replaceable Bulb

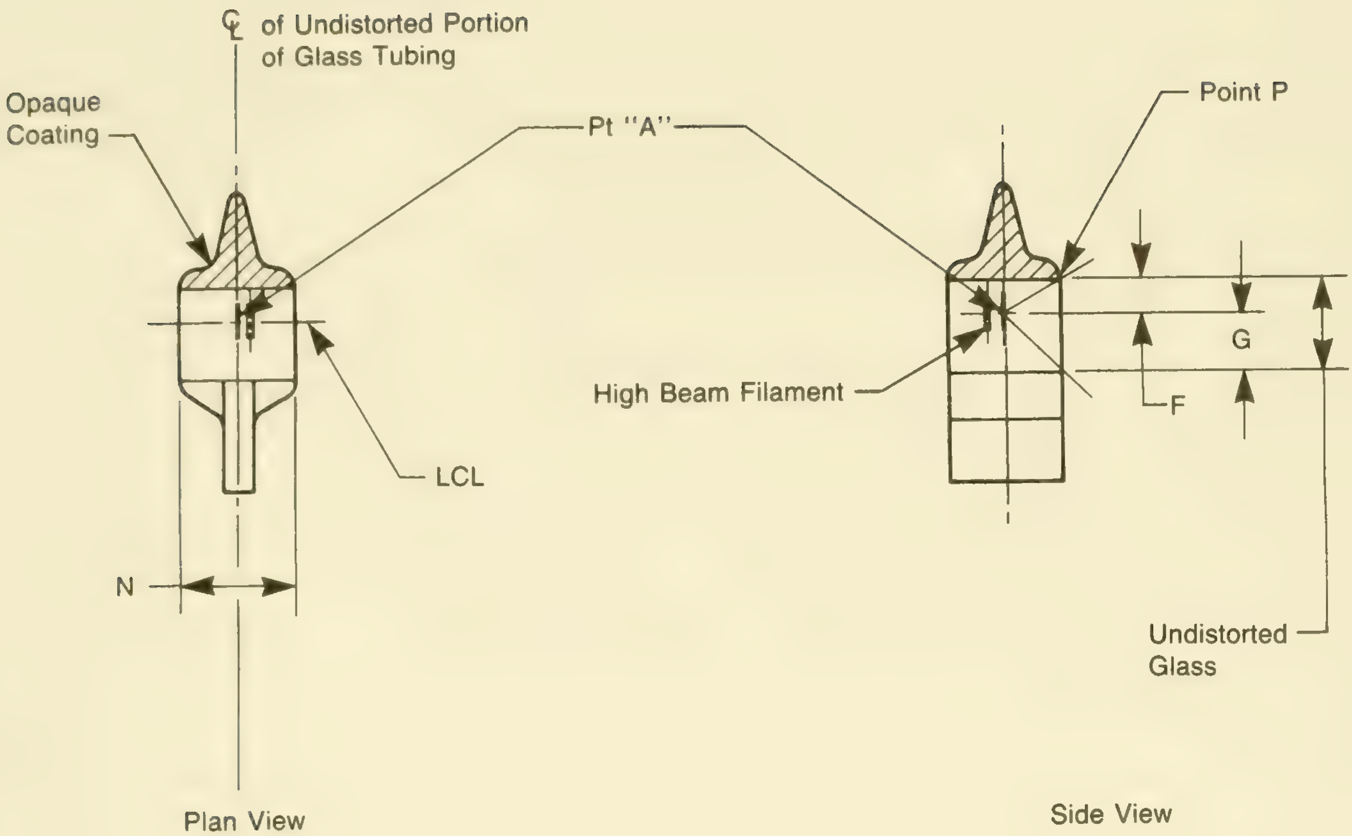
(See reverse page for dimensional specifications

Dimensional Specifications
Figure 24-3

Dimension	Inches	Millimeters
AA	120°	120°
AB	150°	150°
AC	0.193 Min.	4.9 Min.
AD	44° 30'	44° 30'
AE	0.722 ± 0.008	18.35 ± 0.20
AF	120°	120°
AG	120°	120°
AJ	0.142 ± 0.008	3.6 ± 0.20
AK	60°	60°
A	1.028 ± 0.008	26.10 ± 0.20
B	0.289 ± 0.010	7.35 ± 0.25
C	0.289 ± 0.010	7.35 ± 0.25
D	0.051 ± 0.008	1.30 ± 0.20
E	0.055 ± 0.008	1.40 ± 0.20
F	0.278 ± 0.006	7.05 ± 0.15
G	0.059 ± 0.008	1.50 ± 0.20
J	0.142 ± 0.010	3.60 ± 0.25
K	0.811 ± 0.008	20.60 ± 0.20
L	0.535 ± 0.008R	13.60 ± 0.20R
M	0.118 ± 0.004	3.00 ± 0.10
R	0.075 ± 0.010	1.90 ± 0.25
S	0.025 ± 0.002	0.63 ± 0.05
U	0.222 ± 0.008R	5.65 ± 0.20R
W	0.010 ± 0.006	0.25 ± 0.15

Tolerance for All Angular
Dimensions ± 1°

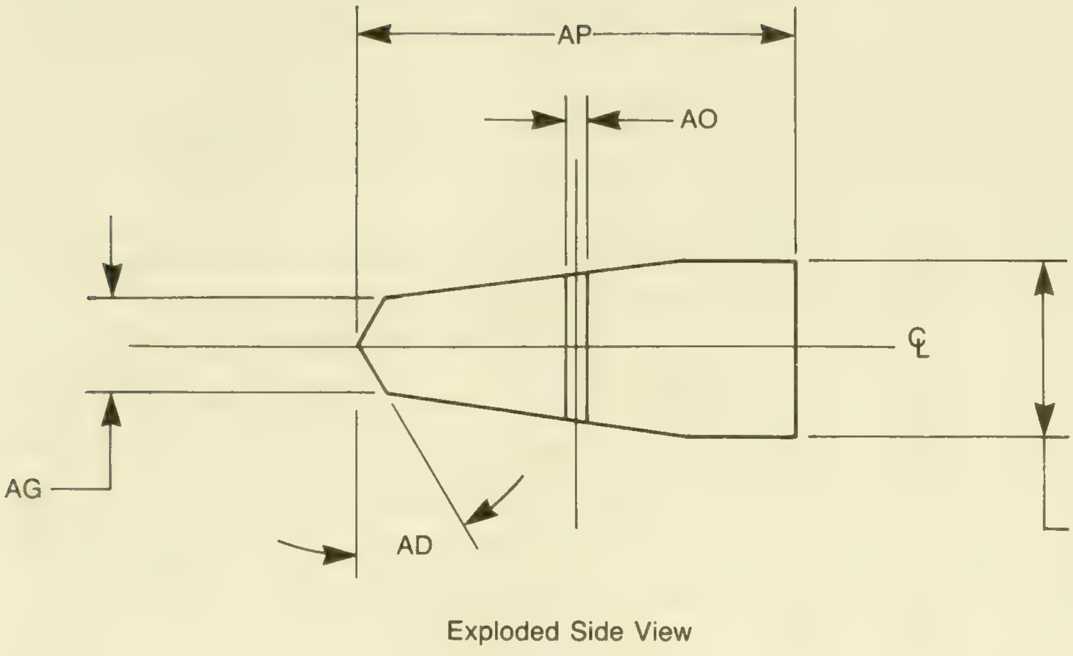
Figure 24-4. - Specification for the HB5 Replaceable Bulb



Dimensional Specifications

Dimension	
F	(N/2)TAN 38° ± 1.0 mm (±0.039 in)
G	(N/2)TAN 43° Minimum
N	Actual Capsule Dia. (To Be Established By Manufacturer)
P	Entire Radius and Distorted Glass Shall Be Covered to the Plane Passing Through Point "P" Perpendicular to the Glass Capsule Centerline.

Figure 24-5. - Specification for the HB5 Replaceable Bulb



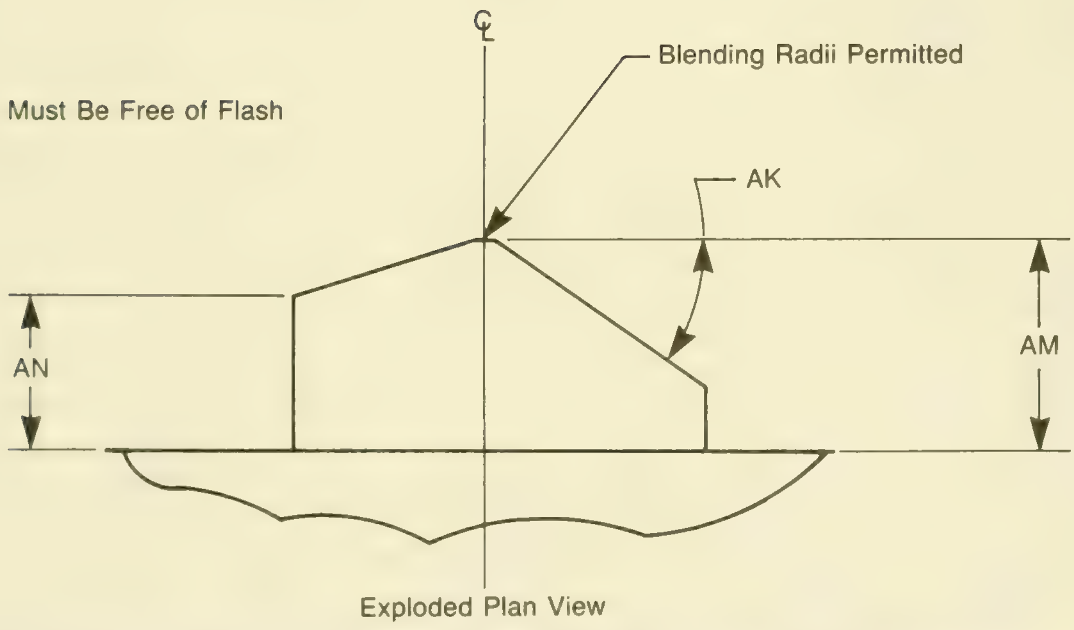


Figure 24-6. - Specification for the HB5 Replaceable Bulb Locking Feature

(See reverse page for dimensional specifications)

Dimensional Specifications
Figure 24-6

Dimension	Inches	Millimeters
AC	0.179 ± 0.008	4.55 ± 0.20
AD	30° ± 3°	30° ± 3°
AG	0.098 ± 0.008	2.50 ± 0.20
AK	35° ± 3°	35° ± 3°
AM	0.217 ± 0.008	5.50 ± 0.20
AN	0.157 ± 0.008	4.00 ± 0.20
AO*	0.02 ± 0.008	0.5 ± 0.20
AP	0.45 ± 0.008	11.4 ± 0.20

* Blending radii permitted

Figure 24-7. - Specification for the HB5 Replaceable Bulb Locking Feature

following: The table on the adapter plate shall be of sufficient size to completely contain the test fixture base with no overhang. The vibration shall be applied in the vertical axis of the headlamp system as mounted on the vehicle. The filament shall not be energized. **(54 F.R. 20006—May 9, 1989. Effective: June 8, 1989)]**

[S8.10 Sealing. An unfixtured headlamp in its design mounting position shall be placed in water at a temperature of 176 +/− 5 degrees F (60 +/− 3 degrees C) for one hour. The headlamp shall be energized in its highest wattage mode, with the test voltage at 12.8 +/− 0.1 V. during immersion. The lamp shall then be de-energized and immediately submerged in its design mounting position into water at 32 +5−0 degrees F (0 +3−0 degrees C). The water shall be in a pressurized vessel, and the pressure shall be increased to psi (70 kPa), upon placing the lamp in the water. The lamp shall remain in the pressurized vessel for a period of thirty minutes. This entire procedure shall be repeated for four cycles. Then the lamp shall be inspected for any signs of water on its interior. During the high temperature portion of the cycles, the lamp shall be observed for signs of air escaping from its interior. If any water occurs on the interior or air escapes, the lamp is not a sealed lamp. **(54 F.R. 20006—May 9, 1989. Effective: June 8, 1989)]**

[S9. Deflection test for standardized replaceable light sources. With the light source rigidly mounted in a fixture in a manner indicated in Figure 8, a force of 4.0 ± 0.1 pounds (17.8 ± 0.4N) is applied at a distance "A" from the reference plane perpendicular to the longitudinal axis of the glass capsule and parallel to the smallest dimension of the pressed glass capsule seal. The force shall be applied (using a rod with a hard rubber tip with a minimum spherical radius of .039 in (1 mm) radially to the surface of the glass capsule in four locations in a plane parallel to the reference plane and spaced at a distance "A" from that plane. These force applications shall be spaced 90 degrees apart starting at the point perpendicular to the smallest dimension of the pressed seal of the glass capsule. The bulb deflection shall be measured at the glass capsule surface at 180 degrees opposite to the force application. **(54 F.R. 20006—May 9, 1989. Effective: June 8, 1989)]**

S10. Simultaneous Aim Photometry Tests. [(a) *Type F Headlamp Systems.* The assembly shall be located on a goniometer placed not less than 60 feet (18.3m) from the photometer. The LF unit shall be aimed mechanically by centering the unit on the photometer axis and by alingning the aiming plane of the lens perpendicular to the photometer axis. Then the assembly shall be moved in a plane parallel to the established aiming plane of the LF headlamp until the UF headlamp is centered on the photometer axis. Photometry measurements of the UF photometry unit shall be completed using the aiming plane so established, and the procedures of section S4.1 and 4.1.4 Standard J1383 APR 85, and Figure 15. A reaim tolerance of ± ¼ degree is permitted in any direction at any test point.

(b) *Integral Beam Headlamp Systems.* The assembly used for simultaneously aiming more than one integral beam headlamp shall be placed on a test fixture on a goniometer located not less than 60 feet (18.3m.) from the photometer. The assembly shall be aimed by centering the geometric center of the lower beam lens(es) on the photometer axis and by aligning the photometer axis to be perpendicular to the aiming reference plane or appropriate vertical plane defined by the manufacturer of any lower beam contributor. Photometric compliance of the lower beam shall be determined with all lower beam contributors illuminated and in accordance with sections 4.1 and 4.1.6 of SAE Standard J1383 APR 85, and Figure 15. The assembly shall then be moved in a plane parallel to the established aiming plane of the lower beam until the assembly is located with the geometric center of the upper lens(es) on the photometer axis. Photometric compliance for upper beam shall now be determined using the figure and procedure specified for the lower beam. During photometric testing, a ¼ degree reaim is permitted in any direction at any test point. **(54 F.R. 20006—May 9, 1989. Effective: June 8, 1989)]**

35 F.R. 16842
October 31, 1970

TABLE I.—Required Motor Vehicle Lighting Equipment Other Than Headlamps—
Multipurpose Passenger Vehicles, Trucks, Trailers, and Buses, of 80 or More Inches
Overall Width

Item Column 1	Multipurpose passenger vehicles, trucks and buses Column 2	Trailers Column 3	Applicable SAE standards or recommended practice Column 4
Taillamps [2]	2 red	2 red	J585e, September 1977
Stoplamps	2 red	2 red	[SAE J1398 May 1985]
License plate lamp [1]	1 white	1 white	J587, October 1981
Reflex reflectors	4 red; 2 amber	4 red; 2 amber	J594f, January 1977
Side marker lamps	4 red; 2 amber	2 red; 2 amber	J592e, July 1972
Backup lamp [1]	1 white	None	J593c, February 1968
Turn signal lamps	2 red or amber; 2 amber	2 red or amber.	[SAE J1395 April 1985]
Turn signal operating unit. [3]	1	None	J589, April 1964
Turn signal flasher	1	None	J590b, October 1965
Vehicular hazard warning signal operating unit	1	None	J910, January 1966
Vehicular hazard warning signal flasher	1	None	J945, February 1966
Identification lamps	3 amber; 3 red	3 red	J592e, July 1972
Clearance lamps	2 amber; 2 red	2 amber; 2 red	J592e, July 1972
Intermediate side marker lamps. [4]	2 amber	2 amber	J592e, July 1972
Intermediate side reflex reflectors [4]	2 amber	2 amber	J594f, January 1977

(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]

[1] See S5.1.1.10. [2] See S5.1.1.11-12. [3] See S5.5.6. [4] See S5.1.1.3.

TABLE II.—Location of Required Motor Vehicle Lighting Equipment Multipurpose Passenger Vehicles, Trucks, Trailers, and Buses, Of 80 Or More Inches Overall Width

Item Column 1	Location on— Multipurpose passenger vehicles, trucks, and buses Column 2	Location on— Trailers Column 3	Height above road surface measured from center of item on vehicle at curb weight Column 4
Headlamps	On the front, each headlamp providing the upper beam, at the same height, 1 on each side of the vertical centerline, each headlamp providing the lower beam, at the same height, 1 on each side of the vertical centerline, as far apart as practicable. [See also S7]	Not required	Not less than 22 inches (55.9 cm) nor more than 54 inches (137.2 cm)
Taillamps	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	Not less than 15 inches, nor more than 72 inches
Stoplamps	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	Not less than 15 inches, nor more than 72 inches
License-plate lamp	At rear license plate, to illuminate the plate from the top or sides	At rear license plate to illuminate the plate from the top or sides	No requirement
Backup lamp	On the rear	Not required	No requirement
Turn-signal lamps	At or near the front—1 amber on each side of the vertical centerline, at the same height, and as far apart as practicable. On the rear—1 red or amber on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear—1 red or amber on each side of the vertical centerline, at the same height, and as far apart as practicable	Not less than 15 inches, nor more than 83 inches
Identification lamps	On the front and rear—3 lamps, amber in front, red in rear, as close as practicable to the top of the vehicle, at the same height, as close as practicable to the vertical centerline, with lamp centers spaced not less than 6 inches or more than 12 inches apart. Alternatively, the front lamps may be located as close as practicable to the top of the cab.	(On the rear—3 lamps as close as practicable to the top of the vehicle at the same height, as close as practicable to the vertical centerline, with lamp centers spaced not less than 6 inches or more than 12 inches apart.)	On the front only—No part of the lamp or mountings shall extend below the top of the vehicle's windshield
Clearance lamps	On the front and rear—2 amber lamps on front, 2 red lamps on rear, to indicate the overall width of the vehicle, one on each side of the vertical centerline, at the same height, and as near the top as practicable	On the front and rear—2 amber lamps on front, 2 red lamps on rear, to indicate the overall width of the vehicle, one on each side of the vertical centerline, at the same height, and as near the top thereof as practicable	No requirement
Intermediate side marker lamps	On each side—1 amber lamp located at or near the midpoint between the front and rear side-marker lamps	On each side—1 amber lamp located at or near the midpoint between the front and rear side marker lamps	Not less than 15 inches
Intermediate side reflex reflectors	On each side—1 amber located at or near the midpoint between the front and rear side reflex reflectors	On each side—1 amber located at or near the midpoint between the front and rear side reflex reflectors	Not less than 15 inches nor more than 60 inches
Reflex reflectors	On the rear—1 red on each side of the vertical centerline, as far apart as practicable, and at the same height On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	On the rear—1 red on each side of the vertical centerline, as far apart as practicable, and at the same height On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	Not less than 15 inches nor more than 60 inches
Side marker lamps	On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	Not less than 15 inches, and on the rear of trailers not more than 60 inches

* [(54 F.R. 30223—July 19, 1986. Effective: July 19, 1986)]

TABLE III.—Required Motor Vehicle Lighting Equipment
All Passenger Cars and Motorcycles, and Multipurpose Passenger Vehicles, Trucks, Trailers, and Buses, of Less Than 80 Inches Overall Width

Item Column 1	Passenger cars, multipurpose passenger vehicles, trucks, and buses Column 2	Trailers Column 3	Motorcycles Column 4	Applicable SAE standards or recommended practices Column 5
Headlamps	See S7			
Taillamps [2]	2 red	2 red	1 red	J585e, September 1977.
Stoplamps	2 red	2 red	1 red	[SAE J586, February 1984.]
High mounted stoplamp	1 red, for passenger cars only	Not required	Not required	J186a, September 1977.
License plate lamp [1]	1 white	1 white	1 white	J587, October 1981.
Parking lamps [2]	2 amber or white	None	None	J222, December 1970.
Reflex reflectors	4 red, [2] amber	4 red; 2 amber	3 red; 2 amber	J594f, January 1977.
Intermediate side reflex reflectors [5]	2 amber	2 amber	None	J594f, January 1977.
Intermediate side marker lamps [5]	2 amber	2 amber	None	J592e, July 1972.
Side marker lamps	2 red, 2 amber	2 red; 2 amber	None	J592e, July 1972.
Backup lamp	1 white	None	None	J593c, February 1968.
Turn signal lamps [3]	2 red or amber; 2 amber.	2 red or amber.	2 amber; 2 red or amber.	[SAE J588, November 1984.]
Turn signal operating unit [3 4]	1	None	1	J589, April 1964.
Turn signal flasher	1	None	1	J590b, October 1965.
Vehicular hazard warning signal operating unit	1	None	None	J910, January 1966.
Vehicular hazard warning signal flasher	1	None	None	J945, February 1966.

[(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]

[1] See S5.1.1.10. [2] See S5.1.1.11-12. [3] See S5.5.6. [4] See S5.1.1.5. [5] See S5.1.1.3.

housing, or vice versa, it shall conform with the photometrics applicable to it with the lens at any position relative to the reflector within the aim range limits of paragraphs S7.7.3 and S7.7.4, or any combination.

[**S7.7.3.** When a headlamp system is tested in a laboratory, the range of its vertical aim shall not be less than +/− 4 degrees from the nominal correct air position for the intended vehicle application. When installed on a motor vehicle, the range of vertical aim shall be not less than the full range of pitch of the vehicle on which the headlamp system is installed. The installed range of static pitch angle shall as a minimum be determined from unloaded vehicle weight to gross vehicle weight rating, and incorporate pitch angle effects from maximum trailer or truck loadings, the full range of tire intermix sizes and suspensions recommended and/or installed by the vehicle manufacturer, and the anticipated effects of variable passenger loading. The vertical aim adjustment mechanism shall be continuously adjustable over the full range.

[**S7.7.4.** When a headlamp system is tested in a laboratory, the range of its horizontal aim shall be not less than 2.5 degrees from the nominal correct aim position for the intended vehicle application.

[**S7.7.5.** When a headlamp system is installed on a motor vehicle, it shall be aimable with either an externally applied aiming device or on-vehicle headlamp aiming devices installed by the vehicle manufacturer. When activated in a steady-burning state, headlamps shall not have any styling ornament or other feature, such as a translucent cover or grill, in front of the lens. Headlamp wipers may be used in front of the lens provided that the headlamp system is designed to conform with all applicable photometric requirements with the wiper stopper in any position in front of the lens.

[**S7.7.5.1. External aiming.** (a) The aim of the headlamps in each headlamp system, other than a headlamp system designed to conform to section S7.3, that is designed to use such external aiming devices, shall not deviate more than 0.30 degree when a downward torque of 20 lb.-in. (2.25 N-m) is removed from the headlamp in its design operating position. The downward force used to create the torque shall be applied parallel to the aiming reference plane, through the aiming pads, and displaced forward using a lever arm such that the force is applied on an axis that is prependicular to the aiming reference plane and originates at the center of the aiming pad pattern (see Figures 4-1 and 4-3). For headlamps using the aiming pad locations of Group 1, the distance between the point of application of force and the aiming reference plane shall be not less than 6.625 in. (168.3 mm) plus the distance from the aiming reference plane to the secondary plane, if used (see section S7.7.5.1(d)(1)). For headlamps using the aiming pad locations of Group II, the distance between the point of application of force and the aiming reference plane shall be not less than 6.609 in. (167.9 mm) plus the distance from the aiming reference plane to the secondary plane, if used. For headlamps using the nonadjustable Headlamp Aiming Device Locating Plates for the 146 mm diameter, the 176 mm diameter, and the 92 × 150 mm sealed beam units, the distance between the point of application of force and the aiming plane shall, respectively, be not less than 6.984 in. (177.4 mm), 6.937 in. (176.2 mm), and 7.625 in. (193.7 mm). **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

Each headlamp system that is designed to conform to paragraph S7.5 and that is designed to use such external aiming devices, and which is manufactured on or after December 1, 1989, shall comply with this paragraph.

(b) When a headlamp is installed on a motor vehicle, its aim in any direction shall not change by more than 0.30 degree nor shall the lamp recede more than 0.1 in. (2.5 mm.) after being subjected to an inward force of 50 pounds (222 newtons) applied evenly to the lens parallel to the mechanical axis.

(c) Each headlamp system mounting and aiming mechanism shall be subjected to a salt spray (fog) test in accordance with ASTM B117-73 *Method of Salt Spray (Fog) Testing* for a period of 50 hours, consisting of two successive 25 hour periods of 24 hours exposure followed by 1 hour of drying. At the end of 50 hours, the headlamp system shall be capable of meeting any of the applicable requirements of paragraph S7.7.

(d) Each headlamp system which is designed to use the Headlamp Aiming Device Locating Plates with adjustable legs for the 100 × 165 mm unit and the 142 × 200 mm unit, and which has adjustable length legs, shall meet the requirements of subparagraphs (1) and (2) below.

Group	Test point, degrees	Total for group, candela (see note 1)
1[1]	45L–5U, 45L–H, 45L–5D, . . .	45
2[1]	30L–H, 30L–5D	50
3	10L–10U, 10L–5U, V–10U, V–5U, 10R–10U, 10R–5U . . .	100
4	10L–H, 10L–5D, V–H, V–5D, 10R–H, 10R–5D	360
5[1]	30R–H, 30R–5D	50
6[1]	45R–5U, 45R–H, 45R–5D . . .	45

FIGURE 2—Minimum Luminous Intensity Requirement for Backup Lamps

[1] When 2 lamps of the same or symmetrically opposite design are used, the reading along the vertical axis and the averages of the readings for the same angles left and right of vertical for 1 lamp shall be used to determine compliance with the requirements. If 2 lamps of differing designs are used, they shall be tested individually and the values added to determine that the combined units meet twice the candela requirements.

When only 1 backup lamp is used on the vehicle, it shall be tested to twice the candela requirements.

(1) The lens shall have three aiming pads which meet the requirements of Figure 4, *Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units.* The aiming pads need not be centered at the geometric center of the lens, or on the optical axis. Except as provided in subparagraph (2), a whole number, which represents the distance in tenths of an inch (i.e. 0.3 inch = 3) from the aiming reference plane to the respective aiming pads which are not in contact with that plane, shall be inscribed adjacent to each respective aiming pad on the lens. The height of these numbers shall be not less than .157 in (4 mm). If there is interference between the plane and the area of the lens between the aiming pads, the whole number represents the distance to a secondary plane. The secondary plane shall be located parallel to the aiming reference plane and as close to the lens as possible without causing interference.

(2) If the most forward aiming pad is the lower inboard aiming pad, then the dimensions may be placed anywhere on the lens. The dimension for the outboard aiming pad (Dimension F in Figure 4) shall be followed by the letter "H" and the dimension for the center aiming pad shall be followed by the letter "V." The dimensions shall be expressed in tenths of an inch.

(e) Each headlamp may be designed to use the nonadjustable Headlamp Aiming Device Locating Plate for the 100 × 165 mm unit, the 142 × 200mm unit, the 146 mm diameter unit, or the 178 mm diameter unit of SAE J602, or the 92 × 150 mm Type F unit, and incorporate lens mounted aiming pads as specified for those units in Figures 10, 13, 5, or 7 respectively in SAE J1383 APR 85, or Figure 11 of this standard for the Type F unit. If so designed, no additional lens marking is necessary to designate the type of plate or dimensions.

[S7.7.5.2 **On-vehicle aiming.** Each headlamp system that is capable of being aimed by equipment installed on the vehicle shall include a Vehicle Headlamp Aiming Device (VHAD) that conforms to the following requirements:

(a) *Aim.* The VHAD shall provide for headlamp air inspection and adjustment in both the vertical and horizontal axes.

(1) *Vertical aim*: The VHAD shall include the necessary references and scales relative to the horizontal plane to assure correct vertical aim for photometry and aiming purposes. An off-vehicle measurement of the angle of the plane of the ground is permitted. In addition, an equal number of graduations from the "O" position representing angular changes in the axis in the upward and downward directions shall be provided.

(i) Each graduation shall represent a change in the vertical position of the mechanical axis not larger then 0.19 degree (1 in. at 25 ft.) to provide for variations in aim at least 1.2 degrees above and below the horizontal, and have an accuracy relative to the zero mark of less than 0.1 degree.

(ii) The VHAD shall be marked to indicate headlamp aim movement in the upward and downward directions.

(iii) Each graduation shall indicate a linear movement of the scale indicator of not less than 0.05 in. (1.27 mm) if a direct reading analog indicator is used. If a remote reading indicator is provided, it shall represent the actual aim movement in a clear, understandable format.

(iv) The vertical indicator shall perform through a minimum range of +/− 1.2 degrees.

(v) Means shall be provided in the VHAD for compensation for deviations in floor slope not

less than 1.2 degrees from the horizontal that would affect the correct positioning of the headlamp for vertical aim.

(vi) The graduations shall be legible under an illumination level not greater than 30 foot candles, measured at the top of the graduation, by an observer having 20/20 vision (Snellen), and shall permit aim adjustment to within 0.19 degree (1 in. at 25 ft.).

(2) *Horizontal aim.* The VHAD shall include references and scales relative to the longitudinal axis of the vehicle necessary to assure correct horizontal aim for photometry and aiming purposes. An "O" mark shall be used to indicate alignment of the headlamps relative to the longitudinal axis of the vehicle. In addition, an equal number of graduations from the "O" position representing equal angular changes in the axis relative to the vehicle axis shall be provided.

(i) Each graduation shall represent a change in the horizontal position of the mechanical axis not greater than 0.38 degree (2 in. at 25 ft.) to provide for variations in aim at least 0.76 degree (4 in. at 25 ft.) to the left and right of the longitudinal axis of the vehicle, and shall have an accuracy relative to the zero mark of less than 0.1 degree.

(ii) The VHAD shall be marked to indicate headlamp aim movement in the left and right directions.

(iii) The graduations shall be legible under an illumination level not greater than 30 foot candles, measured at the top of the top of the radiator, by an observer having 20/20 vision (Snellen), and shall permit aim adjustment to within 0.38 degree (2 in. at 25 ft.).

(iv) The horizontal indicator shall perform through a minimum range of +/− 0.76 degree (4 in. at 25 ft.); however, the indicator itself shall be capable of recalibration over a movement of +/− 2.5 degrees relative to the longitudinal axis of the vehicle to accommodate any adjustment necessary for recalibrating the indicator after vehicle repair from accident damage.

(b) *Aiming instructions.* (1) The instructions for properly aiming the headlighting system using the VHAD shall be provided on a label permanently affixed to the vehicle adjacent to the VHAD, or in the vehicle operator's manual. The instructions shall advise that the headlighting system is properly aimed if the appropriate vertical plane (as defined by the vehicle manufacturer) is perpendicular to both the longitudinal axis of the vehicle, and a horizontal plane when the vehicle is on a horizontal surface, and the VHAD is set at "O" vertical and "O" horizontal.

(2) Should a remote indicator or a remote indicator and adjuster be provided, the instructions shall be placed in the operator's manual, and may also be placed on a label adjacent to the VHAD.

[(3) Should the mechanism not meet the requirements of S7.7.2.1, on each motor vehicle manufactured on or after September 1, 1990, a cautionary label shall be placed adjacent to the mechanism stating the caution and including either the reason for the caution or the corrective action necessary. Each such label shall also refer the reader to the vehicle operator's manual for complete instructions. Each such vehicle shall be equipped with an operator's manual containing the complete instructions appropriate for the mechanism installed. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)**]

(c) *Testing the VHAD.*

(1) The headlamp assembly (the headlamp(s) and the VHAD(s) mechanism) shall be mounted on a level goniometer, aligned to a photometer located not less than 60 ft. (18.3m) from the VHAD assembly. The assembly shall be mechanically aimed using the VHAD in accordance with the manufacturer's instructions as provided with the vehicle on which the VHAD is intended to be used. A ¼ degree reaim is permitted in any direction at any test point to allow for variations in readings between laboratories. The test shall be conducted in accordance with the procedures of paragraphs 4.1 and 4.1.4 of SAE J1383 APR 85. Under these conditions the mounted headlamp assembly shall be designed to conform to the photometric requirements appropriate for the headlamp system under test.

(2) When tested in accordance with subsection (1) of this section, with any replacement headlamp unit(s) or light sources intended for use in the system under test, the VHAD and headlamp system shall be designed to conform to the photometric performance requirements appropriate for the system under test.

(3) The same VHAD and associated headlamp(s) (or headlamp assembly) shall be rigidly mounted in a headlamp test fixture and comply with the following laboratory test procedures:

(i) Each graduation on the horizontal and vertical aim scales shall be checked and any variation from the correct aim shall not exceed +/− 0.2 degree, and +/− 0.1 degree, respectively.

(ii) With the aiming plane horizontal and vertical and with the scale on the device set at O, the aimer shall be adjusted before each of the following tests to assure that the indicators are centered at O.

(ii)(A) The VHAD and an unlighted headlamp assembly shall be stabilized at 20 +/− 5 degrees F (−7 +/− 3 degrees C) in a circulating air environmental test chamber. After a period of 30 minutes, when measured at that soak temperature, the variation from correct horizontal or vertical aim shall not exceed +/− 0.2 degree, and +/− 0.1 degree, respectively.

(ii)(B) The VHAD, and the headlamp assembly with its highest wattage filament (or combination of filaments intended to be used simultaneously) energized at its design voltage, shall than be stabilized at 100 +/− 5 degrees F (38 +/− 3 degrees C) in a circulating air environmental test chamber. After a period of 30 minutes, when measured at that soak temperature, the variation from correct horizontal and vertical aim shall not exceed +/− 0.2 degree, and +/− 0.1 degree, respectively.

(ii)(c) The VHAD and an unlighted headlamp assembly shall then be placed in a circulating air environmental test chamber and exposed to a temperature of 140 +/− 5 degrees F (60 +/− 3 degrees C) for 24 hours, followed by a temperature of −40 5 degrees F (−40 +/− 3 degrees C) for 24 hours and then permitted to return to room temperature, after which the VHAD and headlamp assembly shall show no damage which would impair its ability to perform as specified herein. The variation from correct horizontal or vertical aim shall not exceed +/− 0.2 degree, and +/− 0.1 degree, respectively.

(ii)(d) The VHAD and headlamp assembly shall then be tested according to the corrosion test procedure of paragraph S7.7.5.1(c).

(ii)(E) The VHAD and headlamp assembly shall then be tested for photometric compliance as specified in paragraphs S7.7.5.2(c)(1) and (2).

S8 Tests and Procedures for Integral Beam and Replaceable Bulb Headlighting Systems. When tested in accordance with the following procedures, each integral beam headlamp shall meet the requirements of paragraph S7.4, and each replaceable bulb headlamp shall meet the requirements of paragraph S7.5.

S8.1 Photometry. Each headlamp to which paragraph S8 applies shall be tested according to paragraphs 4.1 and 4.1.4 of SAE Standard J1383 APR 85 for meeting the applicable photometric requirements, after each test specified in paragraphs S8.2, S8.3, S8.5, S8.6.1, S8.6.2, and S8.7. A ¼ degree reaim is permitted in any direction at any testpoint.

S8.2. Abrasion. (a) A headlamp shall be mounted in the abrasion-test fixture in the manner indicated in Figure 5 with the lens facing upward.

(b) An abrading pad meeting the requirements in paragraphs (c) (1) through (c) (4) of this section shall be cycled back and forth (1 cycle) for 11 cycles at 4 ± 0.8 in. (10 cm ± 2 cm) per second over at least 80 percent of the lens surface, including all the area between the upper and lower aiming pads, but not including lens covers and edges.

(c) (1) The abrading pad shall be not less than 1.0 ± .04 in. (2.5 cm ± .1 cm) wide, constructed of 0000 steel wool, and rubber cemented to a rigid base shaped to the same vertical contour of the lens. The "grain" of the pad shall be perpendicular to the direction of motion.

(2) The abrading pad support shall be equal in size to the pad and the center of the support surface shall be within ± .08 in. (± 2 mm) of parallel to the lens surface.

(3) The density of the abrading pad shall be such that when the pad is mounted to its support and is resting unweighted on the lens, the base of the pad shall be no closer than .125 in. (3.2 mm) to the lens at its closest point.

(4) When mounted on its support and resting on the lens of the test headlamp, the abrading pad shall then be weighted such that a pad pressure of 2.0 ± .15 psi (14 ± 1 kPa) exists at the center and perpendicular to the face of the lens.

(d) A pivot shall be used if it is required to follow the contour of the lens.

(e) Unused steel wool shall be used for each test.

[S8.3.] Chemical resistance. (a) The entire exterior lens surface of the fixtured headlamp and top surface of the lens-reflector joint shall be wiped once to the left and once to the right with a 6-inch-square soft cotton cloth (with pressure equally applied) which has been saturated once in a container with 2 ounces of one of the test fluids listed in paragraph (b) of this section. The lamp shall be wiped within 5 seconds after removal of the cloth from the test fluid.

(b) The test fluids are:

(1) ASTM Reference Fuel C, which is composed of Isooctane 50 volume % and Toluene 50 volume %. Isooctane must conform to A2.7 in Annex 2 of the Motor Fuels Section of the 1985 *Annual Book of ASTM Standards* Vol. 05.04, and Toluene must conform to ASTM specification D362-84, *Standard Specification for Industrial Grade Toluene.* ASTM Reference Fuel C must be used as specified in:

(i) Paragraph A2.3.2 and A2.3.3 of Annex 2 to *Motor Fuels, Section 1* in the *1985 Annual Book of ASTM Standards*; and

(ii) OSHA Standard 29 CFR 1910.106–*Handling Storage and Use of Flammable Combustible Liquids.*

(2) Tar remover (consisting by volume of 45% xylene and 55% petroleum base mineral spirits).

(3) Power steering fluid (as specified by the vehicle manufacturer for use in the motor vehicle on which the headlamp is intended to be installed).

(4) Windshield washer fluid consisting of 0.5% monoethanolamine with the remainder 50% concentrations of methanol/distilled water by volume.

(5) Antifreeze (50% concentration of ethylene glycol/distilled water by volume).

(c) After the headlamp has been wiped with the test fluid, it shall be stored in designed operating attitude for 48 hours at a temperature of 73°F ± 7° (23°C ± 4°) and a relative humidity of 30 ± 10 percent. At the end of the 48-hour period, the headlamp shall be wiped clean with a soft dry cotton cloth and visually inspected.

[S8.4.] Corrosion. (a) A connector test shall be performed on each filament circuit prior to the test in subparagraph (b) according to Figure 1 of SAE Standard J580, [DEC 86]. The power source shall be set to provide 12.8 volts and the resistance shall be set to produce 10 amperes.

(b) The headlamp with connector attached to the terminals, unfixtured and in its designed operating attitude with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be subjected to a salt spray (fog) test in accordance with ASTM B117–73, *Method of Salt Spray (FOG) Testing,* for a period of 240 hours, consisting of 10 successive 24-hour periods. During each interval, the headlamp shall be mounted in the middle of the chamber and exposed for 23 hours to the salt spray. The spray shall not be activated for the 24th hour. The bulb shall be removed from the headlamp and from the test chamber during the one hour of salt spray deactivation and reinserted for the start of the next test cycle, at the end of the first and last three 23-hour periods of salt spray exposure, and at the end of any two of the fourth through seventh 23-hour periods of salt-spray exposure. The test chamber shall be closed at all times except for a maximum of 2 minutes which is allowed for removal or replacement of a bulb during each period. After the ten cycles, the lens reflector unit without the bulb shall be immersed in deionized water for five minutes, then secured and allowed to dry by natural convection only.

(c) Using the voltage, resistance and pretest setup of subparagraph (a), the current in each filament circuit shall be measured after the test conducted in subparagraph (b).

[S8.5.] Dust. The headlamp, mounted on a headlamp test fixture, with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be positioned within a cubical box, with inside measurements of 35.4 in. (900 mm) on each side, or larger if required for adequate wall clearance, i.e., a distance of at least 5.9 in. (150 mm) between the headlamp and any wall of the box. The box shall contain 9.9 lb. (4.5 kg) of fine powdered cement which conforms to the ASTM C150–77 *Specification for Portland Cement.* Every 15 minutes, the cement shall be agitated by compressed air or fan blower(s) by projecting blasts of air for a 2-second period in a downward direction so that the cement is diffused as uniformly as possible throughout the entire box. This test shall be continued for five hours, after which the exterior surfaces of the headlamp shall be wiped clean.

[S8.6.] Temperature and internal heat test. A headlamp with one or more standardized replaceable light sources shall be tested according to [S8.6.1] and [S8.6.2.] Tests shall be made with all filaments lighted at design voltage that are intended to be used simultaneously in the headlamp and which in combination draw the highest total wattage. These include but are not limited to filaments used for turn signal lamps, fog lamps, parking lamps, and headlamp lower beams lighted with upper beams when the wiring harness is so connected on the vehicle. If a turn signal is included in the headlamp assembly, it shall be operated at 90 flashes a minute with a $75 \pm 2\%$ current "on time". If the lamp produces both the upper and lower beam, it shall be tested in both the upper beam mode and the lower beam mode under the conditions above described, except for a headlamp with a single [Type HB1 or HB2] light source.

[S8.6.1.] Temperature cycle. A headlamp, mounted on a headlamp test fixture, shall be subjected to 10 complete consecutive cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the lamp shall be energized commencing at point "A" of Figure 6 and de-energized at point "B." Separate or single test chambers may be used to generate the environment of Figure 6. All drain holes, breathing devices or other openings or vents of the headlamp shall be in their normal operating positions.

[S8.6.2.] Internal Heat Test. (a) The headlamp lens surface that would normally be exposed to road dirt shall be uniformly sprayed with any appropriate mixture of dust and water or other appropriate materials to reduce the photometric output at the H-V test point of the upper beam (or the ½D–1 ½R test point of the lower beam as appropriate) to $25 \pm 2\%$ of the output originally measured in the photometric test [conducted pursuant to paragraphs S7.4(i), or S7.5(a) through (e), as applicable. A headlamp with a single [Type HB1 or HB2] light source shall be tested on the upper beam only].

Such reduction shall be determined under the same conditions as that of the original photometric measurement.

(b) After the photometric output of the lamp has been reduced as specified in paragraph (a), the lamp and its mounting hardware shall be mounted in an environmental chamber in a manner similar to that indicated in Figure 7, *Dirt/Ambient Test Setup*. The headlamp shall be soaked for one hour at a temperature of 95+7−0 degrees F (35+4−0 degrees C) and then the lamp shall be energized according to [S8.6] for one hour in a still air condition, allowing the temperature to rise from the soak temperature.

(c) The lamp shall be returned to a room ambient temperature of 73+7−0 degrees F (23+4−0 degrees C) and a relative humidity of $30 \pm 10\%$ and allowed to stabilize to the room ambient temperature. The lens shall then be cleaned.

[S8.7.] Humidity. The headlamp mounted on a test fixture shall be placed in a controlled environment consisting of a temperature of 100+7−0 degrees F (38 +4−0 degrees C) with a relative humidity of not less than 90%. All drain holes, breathing devices, and other designed openings shall be in their normal operating positions. The headlamp shall be subjected to 20 consecutive 6-hour test cycles. In each cycle, it shall be energized for 1 hour at design voltage with the highest combination of filament wattages that are intended to be used, including a turn signal flashing at 90 flashes a minute with a $75 \pm 2\%$ current "on-time," if so equipped, and then de-energized for 5 hours. After completion of the last cycle, the lamp shall be soaked for 1 hour at 73+7−0 degrees F 23+4−0 degrees C) and relative humidity of $30 \pm 10\%$ before it is removed for photometric testing. The headlamp shall be tested for photometrics at 10 ± 1 minute following completion of the humidity test.

[S8.8.] Impact. The headlamp shall be rigidly mounted in a headlamp test fixture on the seating lugs with the mechanical axis (bulb/socket axis) vertical, and the lens upward. The seating plane of the test fixture shall consist of oakwood 0.5 inch (13 mm) thick. One impact shall be delivered to the center of the lens on the mechanical axis, using a steel ball bearing with a diameter of .9055 in. (23 mm) weighing 1.76 oz. (50 gm), dropped freely from a distance of 15.75 in. (40 cm) from the bottom of the ball to the surface of the lens, at the intersection of the ball trajectory and the mechanical axis of the headlamp.

[S8.9 Vibration. A vibration test shall be conducted in accordance with the procedures of SAE Standard J575e *Tests for Motor Vehicle Lighting Devices and Components* August 1970, and the

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 85-08; Notice 5)
RIN 2127-AC86

ACTION: Final rule.

SUMMARY: The requirements for safety belt systems in trucks, buses and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds manufactured on or after September 1, 1990 include special provisions to make those safety belt systems more comfortable and convenient to use. The final rule that originally established these requirements set forth special performance requirements for belt systems equipped with automatic locking retractors (ALRs). For such belt systems, that rule's special performance requirements focused exclusively on the working of the retractor mechanism itself as the means of ensuring comfort for users of these belt systems.

Following receipt of a petition for reconsideration and the issuance of a notice of proposed rulemaking, the agency is issuing this final rule which expands the special performance requirements for belt systems equipped with ALRs to encompass the working of the entire safety belt system instead of focusing on the retractor mechanism alone. This approach achieves the agency's goal of ensuring comfort for users of belt systems equipped with ALRs, without imposing unnecessary restrictions on innovative means of ensuring comfort that do not depend upon the workings of the retractor mechanism alone.

DATES: The changes made in this rule are effective September 1, 1990. These requirements will apply to all trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds manufactured on or after that date.

SUPPLEMENTARY INFORMATION: Since January 1, 1972, Federal Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208) has required vehicle manufacturers to install safety belt systems in heavy vehicles (i.e., trucks, buses, and multipurpose passenger vehicles [MPVs] with a gross vehicle weight rating of more than 10,000 pounds). The safety belts required in those vehicles have had to meet all of the strength requirements set for belt systems in passenger cars and light trucks, buses, and MPVs (those with a gross vehicle weight rating of 10,000 pounds or less). However, the safety belts required in heavy vehicles have not had to meet several requirements for lighter vehicle safety belt systems that make the safety belts more comfortable to wear and easier to use.

The agency adopted several changes to the requirements for belt systems in heavy vehicles to make such belt systems more comfortable to wear and easier to use in a final rule that was published on July 6, 1988 (53 FR 25337). With respect to the type of retractor required to be installed on heavy vehicle belt systems, this rule required that such belt systems be equipped with either an emergency locking retractor (ELR) or an ALR with anti-cinch capability. For the purposes of that rule, the determination of whether a heavy vehicle safety belt system with an ALR had this anti-cinch capability was made by examining the working of the retractor mechanism alone. In the case of a safety belt assembly equipped with an ALR and installed in a heavy vehicle to comply with this requirement, the retractor could *not* retract webbing to the next locking position until at least ¾ of an inch of webbing had moved into the retractor.

NHTSA received three petitions for reconsideration of this rule. The only one of those petitions that is relevant to this rule is the one that was filed by Indiana Mills & Manufacturing, Inc. (IMMI). IMMI's petition asked NHTSA to amend its July 6, 1988 rule to permit safety belt systems that are equipped with an ALR and installed in heavy vehicles to comply with the ¾ inch minimum webbing travel requirement by means other than the working of the retractor itself. According to IMMI, a minimum webbing travel requirement that considered the performance of the entire belt system in meeting the goal of preventing "cinch down," instead of focusing on the performance of the retractor alone, would permit the development of more innovative means of overcoming the cinch-down problem for safety belt systems equipped with ALRs.

NHTSA reexamined its minimum webbing travel

requirements in response to this petition. The purpose of including minimum webbing travel requirements for safety belt systems equipped with ALRs was to ensure that these belt systems would be more comfortable for users than safety belt systems equipped with ALRs that cinched down. Any safety belt system equipped with an ALR that provided enhanced comfort for belt users by preventing "cinch down" would seem to fulfill the purpose served by the minimum webbing travel requirement, *regardless* of whether the retractor alone met that requirement. Accordingly, NHTSA tentatively determined that the current requirement for heavy vehicle safety belt systems is unnecessarily restrictive.

To reflect this tentative determination, the agency issued a July 11, 1989 notice, published at 54 FR 29069, proposing to adopt a less restrictive approach to ensuring occupant comfort when using safety belt systems equipped with ALRs. Instead of focusing solely on the workings of the retractor mechanism to determine if the belt system complies with the minimum webbing travel requirement, as the July 1988 final rule on this subject did, NHTSA proposed in this notice to examine the workings of the belt system *as a whole* to determine if it complies with the minimum webbing travel requirement. A bench test would be used to evaluate the workings of the belt system as a whole. First, the belt system would be buckled. Then the retractor end of the belt system would be anchored. The other end of the belt system would not be anchored during this bench test, and is referred to as the "free end" of the belt system in this rule. The belt webbing would be extended to 75 percent of its length and the ALR would be locked after this initial adjustment. A load of 20 pounds would be applied to the free end of the belt system in the direction away from the retractor. The position of the free end of the belt system would be recorded. Then the 20 pound load would be slowly released (i.e., released within a 30 second period) until the retractor moves to the next locking position. The position of the free end of the belt system would be recorded again. The distance between the recorded positions of the free end of the belt system would have to be equal to or greater than ¾ inch.

NHTSA stated in the July 11, 1989 proposal the agency's belief that this proposed bench test would be satisfied by any safety belt system incorporating an ALR that meets the current requirement for a ¾ inch spacing between ratcheting positions on the retractor. Additionally, vehicles could comply with this proposed bench test if the safety belt system incorporates a device or devices external to the ALR mechanism itself that will operate *automatically* to prevent cinch down. This proposed bench test would *not* be satisfied by devices that must be manually operated to prevent cinch down, because no manual adjustments will be performed during the bench testing.

Four commenters responded to the request for comments on this proposed action. IMMI supported the proposal. The State of Connecticut commented that it supports the concept of moving toward a more performance-oriented test of the entire safety belt system, as proposed in the NPRM, but that it was concerned about the specifics of the bench test proposed in the NPRM. More specifically, Connecticut noted that the proposed bench test would apply a 20 pound load to the free end of the belt system and slowly decrease the load until the retractor moved to the next locking position. Connecticut was concerned that the absence of some intermediate force level at which the belt system must not yet have moved to the next locking position could permit the use of safety belt systems that exert constant force levels objectionable to most wearers.

For instance, Connecticut commented that a belt system would comply with the proposed requirement if it exerted a constant 19 pound load on the wearer. According to Connecticut's comment, a constant 19 pound pull on the safety belt would be objectionable to most wearers and would *not* represent a satisfactory solution to the cinch-down problems associated with ALRs in the past. This commenter suggested that this potential problem could be avoided if the agency were to include a requirement that the free end of the belt assembly shall move less than ¾ inch when the 20 pound pre-load has reached 10 pounds, or some other level. Connecticut commented that this intermediate force level, whether it is set at 10 pounds or some lower level, would be a limit on the belt tension that could be imposed on the wearer.

NHTSA was not persuaded by this comment. While Standard No. 209 does not currently establish any maximum forces that an ALR can impose on a lap belt, NHTSA is unaware of any ALRs currently in use that impose a retractor force of more than one or two pounds. Manufacturers would have no reason to now increase the retractor force up to a level of 19 pounds, because such an increase would make the retractor more expensive and the safety belt system heavier and less comfortable for wearers. Hence, there is no apparent reason for a regulatory requirement to prohibit increases from current retractor force levels.

Additionally, NHTSA does not believe that Connecticut's suggestion to establish an intermediate force level of 10 pounds has any correlation to the real life operational characteristics of an oscillating occupant in a safety belt system. For example, IMMI stated in its submissions that its device requires 14 pounds of force to extend it (which means it would not comply with Connecticut's suggested intermediate force level requirement), but that the force levels

on the occupant drop to 9 pounds as soon as the occupant begins to move the system inward. Then the 9 pound force is reduced to 3 to 4 pounds at the retractor, due to belt/clothing friction. If the maximum operational force for anti-cinch devices were limited to 10 pounds, as suggested by Connecticut, it would be possible for a device to be tested at 10 pounds, operate at 5 pounds, and only provide 1 or 2 pounds of force at the retractor, which may not be sufficient to prevent the retractor spring force from extending the anti-cinch device. In effect, then, this 10 pound intermediate force would require safety belt systems to comply with the anti-cinch requirements by means of the retractor mechanism, because it would be very difficult for any anti-cinch devices external to the retractor to overcome the mass and frictional forces needed to prevent cinch down *and* to comply with this intermediate force level. After considering this comment, NHTSA has concluded that the approach proposed in the NPRM offers the best balance of ensuring occupant comfort (by limiting maximum lap belt forces) while allowing maximum design flexibility for manufacturers to achieve the necessary occupant comfort.

Ford Motor Company (Ford) made a comment similar to Connecticut's. Ford stated that belt tensions of up to 20 pounds would be allowed by this proposal, and that such tension levels would be objectionable to most users. Instead, Ford commented that anti-cinch characteristics should be measured at force levels that are more typical and more likely to be acceptable to users, which Ford suggested would be not more than five pounds for the lap belt.

The agency's response to Ford's comment about the need for a test force lower than 20 pounds is the same as that offered above in Connecticut's comment about the need for a lower test force. Essentially, the agency has no reason to believe that manufacturers would raise retractor force levels above the current one or two pound level, because an increase would make the retractor heavier, bulkier, and more expensive, and would be less comfortable for the wearer.

In addition, the anti-cinch device developed by IMMI was reportedly developed to a specific force level and displacement to fulfill the needs of occupants in heavy trucks. IMMI reported that its anti-cinch device has a steady state load on the occupant of 4 to 6 pounds measured at the anti-cinch device, a corresponding load of 2 to 3 pounds when the load is measured at the retractor, but that in the bench test proposed in the NPRM for this rule 13 to 14 pounds is needed to cause the IMMI device or any other anti-cinch device external to the retractor mechanism to function. NHTSA believes that the data reported by IMMI are consistent with what would be expected and that a 13 to 14 pound minimum force level would be required for effective operation of an anti-cinch device external to the retractor mechanism. The agency is not aware of any consumer complaints about safety belt systems equipped with the IMMI anti-cinch device. To the contrary, the IMMI device appears to have proven successful in the marketplace.

This information suggests that persons operating heavy trucks have found 4 to 6 pounds of lap belt force to be reasonably comfortable. It also suggests that some systems that impose approximately 6 pounds of lap belt force in the real world require much higher force levels to function as designed when subjected to the proposed bench test. Accordingly, Ford's suggestion to establish a 5 pound maximum force level as measured in this bench test is not persuasive, nor would it be viable for any anti-cinch devices external to the retractor.

Finally, the Automotive Occupant Restraints Council (AORC) commented that, while it agrees that the requirements for safety belt comfort and convenience should not restrict design or innovation, the requirements must preclude the possibility of the introduction of excessive slack in the lap belt when it is engaged about the occupant. AORC commented that the current requirements in S4.3(i) of Standard No. 209 limit the amount of slack that can be introduced into a belt system by an ALR to one inch. AORC commented that a device that could be manually adjusted to lock-out the ALR would not appear to comply with the proposed test, because the proposed test does not provide for manual adjustment of any devices on the safety belt system. However, AORC was concerned that a device external to the retractor that did *not* require any manual adjustment would apparently be permitted to introduce unlimited slack under the proposed test. AORC commented that unlimited slack should not be permitted in the final rule, and asked that devices external to the retractor not be permitted to introduce more slack into the belt system than the one inch permitted for the ALR.

NHTSA agrees with AORC's comment that anti-cinch devices external to the ALR should not be permitted to introduce an unlimited amount of slack into the safety belt system. Therefore, this rule adopts a limitation on the maximum amount of slack that may be introduced by such anti-cinch devices. However, the agency does not agree with AORC that the same one inch limitation specified for the ALR should be specified for these external devices, for a number of reasons. First, allowing only two inches of slack (one inch from the ALR and one inch from the anti-cinch device) might not solve the cinch-down problem for ALRs installed in trucks that commonly experience rough riding for occupants, such as cement trucks and garbage trucks. If

this rule does not solve the cinch-down problem for ALRs in those trucks, it will not have achieved its intended purpose.

Second, the larger occupant space of medium- and heavy-duty trucks means that there is a lesser safety need to minimize occupant excursion in these vehicles than is the case in smaller vehicles. For instance, a Chevrolet Caprice passenger car has a head-to-windshield header distance of 13.9 inches and a head-to-windshield distance of 18.7 inches, using a 50th percentile adult male test dummy for these measurements. A GMC Astro 95 truck tractor has a head-to-windshield header distance of 27 inches and a head-to-windshield distance of 31 inches, measured with the same size test dummy. Because of this larger occupant space, permitting greater slack in these vehicles than would be permitted in passenger cars would not have a significant influence on restraint system effectiveness in these larger vehicles.

Third, the IMMI anti-cinch system has been designed to allow more than one inch of slack. As explained above, NHTSA is reluctant to preclude in effect the use of a currently available means of solving the cinch-down problem absent some indications of a need to do so. In this case, NHTSA is unaware of any indications of safety problems associated with the IMMI anti-cinch device. Accordingly, the agency concludes it would be inappropriate to preclude the continued use of the IMMI anti-cinch device as a means of complying with the new anti-cinch requirements for heavy trucks.

After considering these facts, the agency has decided to include in this rule a provision to limit total slack measured during this bench test of the safety belt system to three inches. This three inch total reflects a maximum of one inch slack permitted to be introduced by the ALR, pursuant to Standard No. 209, and a maximum of two inches slack associated with an anti-cinch device external to the retractor itself. The agency would like to note that the safety belt system must comply with this anti-cinch requirement without requiring any additional actions by the belt wearer. Thus, a device that could be manually adjusted to lock-out the ALR could *not* be the means for complying with this new requirement.

These requirements will apply to trucks, buses, and multipurpose passenger vehicles with a gross vehicle weight rating of more than 10,000 pounds manufactured on or after September 1, 1990. This date was chosen since that is also the effective date of the July 1988 amendment to Standard No. 208 requiring that the safety belt systems on these vehicles comply with the anti-cinch requirements by means of the retractor mechanism alone. This rule relieves a restriction in the July 1988 amendments by permitting the anti-cinch requirements to be satisfied either by the working of the retractor mechanism itself *or* by an external device that automatically operates to prevent cinch down. This rule does not impose any additional costs on any party, since any manufacturer that wishes to comply with the anti-cinch requirements by means of the retractor mechanism will continue to be permitted to do so under this rule. Therefore, NHTSA finds for good cause that this rule should become effective on September 1, 1990, instead of at least 180 days after issuance, as specified in section 103(c) of the Safety Act (15 U.S.C. 1392(c)).

NHTSA has considered the effects of this rulemaking action and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. The agency has also determined that the economic and other impacts of this rule are so minimal that a full regulatory evaluation is not required.

Those heavy vehicle manufacturers that choose to rely on the working of the retractor mechanism alone to comply with the test for cinch down, as required by the current regulatory language will not have to change their plans in response to this final rule. On the other hand, this rule will also give manufacturers the option of adopting other innovative approaches to comply with the test for cinch down. Those manufacturers that choose to take advantage of this rule to use an innovative means of solving cinch down could experience some slight cost savings. However, the costs of complying with the anti-cinch retractor requirement have been estimated throughout this rulemaking as being minimal, so any savings from the costs of anti-cinch retractors would necessarily also be minimal.

NHTSA has also considered the effects of this rule under the Regulatory Flexibility Act. I hereby certify that this rule will not have a significant economic impact on a substantial number of small entities. Few, if any, of the heavy vehicle manufacturers are small entities. To the extent that these manufacturers might experience a cost savings as a result of this proposal, the savings will be minimal, as explained above. Likewise, small organizations and small governmental entities will not be significantly affected by this rule. Although those groups do purchase heavy vehicles, this rule will not result in any price increases for heavy vehicles.

In consideration of the foregoing, 49 CFR §571.208 is amended as follows:

1. S4.3.2.2 of Standard No. 208 is revised to read as follows:

S4.3.2 *Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds, manufactured on or after September 1, 1990.* * * *

* * * * *

S4.3.2.2 *Second option—belt system.* The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at a front outboard seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at a front outboard seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following:

(a) An automatic locking retractor used at a front outboard seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at a front outboard seating position must allow at least ¾ inch, but less than 3 inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.3.2.2(b) of this standard is determined as follows:

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least ¾ inch but less than 3 inches.

2. S4.4.2.2 of Standard No. 208 is revised to read as follows:

S4.4.2 *Buses manufactured on or after September 1, 1990.* * * *

* * * * *

S4.4.2.2 *Second option—belt system—driver only.* The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to §571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at the driver's seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at the driver's seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following:

(a) An automatic locking retractor used at a driver's seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at the driver's seating position must allow at least ¾ inch, but less than 3 inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.4.2.2(b) of this standard is determined as follows:

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least ¾ inch but less than 3 inches.

Issued on May 1, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 18889
May 7, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection
(Docket No. 87–08; Notice 6)
RIN 2127–AD12

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: In November 1989, this agency published a final rule mandating the installation of lap/shoulder safety belts in all forward-facing rear outboard seating positions in convertible passenger cars, light trucks and multipurpose passenger vehicles (e.g., passenger vans and utility vehicles), and small buses. This new requirement applies to all such vehicles manufactured on or after September 1, 1991. NHTSA received 14 petitions for reconsideration of this rule.

In response to these petitions, the agency is making several changes to the final rule published in November 1989. These changes are:

1. This notice rescinds the requirement adopted in the November 1989 rule that lap belt portions of safety belts provide some means of locking the lap belt and preventing additional webbing spool out, other than an external device that requires manual attachment or activation by a driver or passenger. Throughout the remainder of this preamble, this requirement is identified as the "lockability requirement." Many petitioners asserted that no objective test for determining compliance with the lockability requirement was specified in the November 1989 final rule, and that the public had not been given notice of and the opportunity to comment on the lockability requirement. This notice responds to these objections by deleting the lockability requirement from the final rule.

However, the agency again tentatively concludes that the substantive purpose of the lockability requirement, i.e., to ensure that rear seat safety belts can tightly secure child safety seats, needs to be addressed in NHTSA's safety standards. The agency hopes to shift the discussion of the lockability requirement toward its substantive merits, and away from the types of objections made to the November 1989 final rule. To that end, a notice of proposed rulemaking to adopt a lockability requirement, including a specific procedure for testing compliance, is published elsewhere in today's edition of the *Federal Register*.

2. The November 1989 final rule included special provisions for lap/shoulder belts installed at rear outboard seating positions on readily removable seats. Such belts were permitted to detach at the upper anchorage only. If those belts were detachable at the upper anchorage, the means of detaching could not include any sort of pushbutton release. A petition for reconsideration asked that lap/shoulder belts on readily removable seats be permitted to detach at either the upper or lower anchorage and that the means of detachment should be permitted to include a pushbutton release. This notice grants the request to permit lap/shoulder belts on readily removable seats to be detachable at either the upper or lower anchorage, but denies the request to permit the detachability to be accomplished by a pushbutton release.

3. The November 1989 final rule required that lap belts or the lap belt portion of lap/shoulder belts installed at *any* rear outboard seating position be equipped with an emergency locking retractor (ELR). A petitioner asked that this requirement be limited to *forward-facing* rear outboard seating positions, so that side-facing or rear-facing outboard seating positions could continue to be equipped with automatic locking retractors (ALRs) on lap belts. Since this rulemaking action had been focused on rear outboard seating positions that are forward-facing, or at least adjustable to be forward-facing, this notice grants the petitioner's request to limit the requirement for ELRs to those types of rear outboard seats.

4. The November 1989 final rule excluded seating positions adjacent to aisleways from the definition of "outboard designated seating position" in trucks, buses, and multipurpose passenger vehicles. A petitioner asked that this same exclusion be extended to passenger cars. This notice grants that request.

DATES: The amendments to S7.1.1.3 and S7.1.1.5

are effective on September 1, 1991. That is the date on which the version of those requirements published in the November 1989 final rule would have become effective. The other amendments made by this rule take effect on [January 28, 1991, 180 days after publication of this rule in the *Federal Register*]. Vehicles manufactured on or after September 1, 1991 must be certified as complying with the requirements of this rule.

Background

On November 29, 1988 (53 FR 47982), NHTSA published a notice of proposed rulemaking (NPRM) proposing to require rear seat lap/shoulder belts to be installed in certain new vehicles. Specifically, this NPRM proposed to require passenger cars (including convertibles), light trucks, light multipurpose passenger vehicles (MPVs), and small buses to be equipped with lap/shoulder safety belts at all forward-facing rear outboard seating positions. Additionally, the NPRM proposed that these rear seat lap/shoulder belts be equipped with a particular type of retractor, that such belts be integral (i.e., the shoulder belt could not be detachable from the lap belt), and that such belts comply with some of the comfort and convenience requirements in Standard No. 208, *Occupant Crash Protection* (49 CFR §571.208).

The agency received more than 70 comments on this NPRM. The issue of whether passenger cars other than convertibles should be equipped with rear seat lap/shoulder belts was relatively straightforward and noncontroversial. The consensus of the commenters was that such a requirement would be appropriate. Hence, to ensure the earliest possible implementation of such a requirement, NHTSA published a final rule on June 14, 1989 (54 FR 25275). That rule addressed only passenger cars other than convertibles, and required that all such vehicles manufactured on or after December 11, 1989 be equipped with rear seat lap/shoulder belts. That rule also expressly deferred resolution of all of the other issues proposed in the NPRM until a later date.

NHTSA published a final rule addressing the other issues raised in the NPRM, including the other vehicle types required to have rear seat lap/shoulder belts, the types of retractors with which those safety belts should be equipped, and the other performance attributes those safety belts should have, on November 2, 1989 (54 FR 46257). The agency received 14 petitions for reconsideration of this rule. This notice responds to those petitions. For the convenience of the reader, this notice uses the same organization and format that the November 2, 1989 final rule did. When a section heading used in the November 2, 1989 preamble is not set forth in this preamble, it means that no petitions for reconsideration requested changes to the rule's provisions discussed in that section.

Requirements of the Rule

Seating Positions Subject to the Requirements

The November 2, 1989 rule limited the requirement for rear seat lap/shoulder belts to outboard seating positions only. The term "outboard designated seating position" is defined at 49 CFR §571.3 as a designated seating position that, among other things, is less than 12 inches from the inside of the vehicle. A separate definition of "outboard designated seating position" was set forth in the November 1989 final rule to exclude seating positions adjacent to aisleways running between the seating position and the near side of the vehicle, even if those seating positions were less than 12 inches from that side of the vehicle. This exclusion of aisleway seats from the rear seat lap/shoulder belt requirement reflected NHTSA's determination that the shoulder belt stretched across the aisleway of a vehicle could cause entry and exit problems for occupants of seating positions to the rear of the aisleway seating position.

The November 1989 rule excluded aisleway seats from the rear seat lap/shoulder belt requirement only if the aisleway seats were in trucks, MPVs, and buses. NHTSA did not extend this exclusion to aisleway seats in the rear of passenger cars because the agency was not aware of any passenger car designs either currently in production or to be produced in the future that incorporate aisleways next to the second row of seats so as to permit access to the third and other more rearward rows of seats.

In its petition for reconsideration, Ford Motor Company (Ford) asserted that the exclusion of aisleway seats from the rear seat lap/shoulder belt requirement should be broadened to apply to aisleway seats in passenger cars as well as the other types of vehicles. According to Ford, the reasons for exempting aisleway seats in vans from rear seat lap/shoulder belt requirements are equally applicable, irrespective of whether the vehicle is classified as a passenger car, truck, MPV, or bus. Ford is implicitly suggesting that passenger vans, especially minivans, could be classified as passenger cars, and that, if such a classification were made, the aisleway seats in the vans would be required to be equipped with lap/shoulder belts if the aisleway seats were outboard seating positions. Ford believes that such aisleway seats should continue to be excluded from the rear seat lap/shoulder belt requirement, regardless of whether the minivan is classified as a passenger car, light truck, MPV, or bus.

NHTSA agrees with Ford's point that the same safety standards should apply to light trucks, MPVs,

buses, and passenger cars, as reflected in the agency's rulemaking actions extending provisions that had applied only to passenger cars so that those same provisions will now also apply to light trucks, MPVs, and buses. Accordingly, this rule includes the same definition of "rear outboard designated seating position" for passenger cars that was previously specified for trucks, MPVs, and buses.

Retractor Types Required for Rear Seat Lap/Shoulder Belts

The NPRM contained a detailed discussion of the agency's previous statements on this subject, and repeated the agency's previous conclusion that only ELRs should be permitted as the retractor for the lap belt portion of the lap/shoulder belt system. *See* 53 FR 47987–47989; November 29, 1988. This proposed requirement was based on the fact that ELRs for the lap belt made the belt system more comfortable and convenient for adult occupants, thereby tending to increase use of the belt system. Although active children can make some child restraints unstable if the child restraint is secured by a lap belt that incorporates an ELR, NHTSA knows of no data showing that this potential instability would affect the safety performance of the child restraint in a crash. Additionally, the agency stated that products called "locking clips" can be installed on the webbing of belts equipped with an ELR to prevent webbing movement.

After analyzing its proposal in response to the many comments received on this subject, NHTSA concluded that the low-speed movement of child safety seats held by safety belts that use an ELR seems to have given rise to questions and concerns about the safety and effectiveness of child seats when used with such belts. In the preamble to the final rule, NHTSA stated:

> Even if these questions and concerns have not been substantiated, the public may not be as likely to use child safety seats if there are perceived questions about the effectiveness of those seats. NHTSA has concluded that it is appropriate to take action to remove those perceived questions, so as to maintain public trust and confidence in the efficacy of child seats. 54 FR 46262; November 2, 1989.

To implement this conclusion, NHTSA devised an approach in its final rule intended to both ensure comfort for adult occupants of safety belt systems and tight securing of child safety seats by those same safety belt systems. First, the final rule required that any lap belt or lap belt portion of a lap/shoulder belt installed at an outboard seating position in compliance with Standard No. 208 be equipped with an ELR. In its petition for reconsideration, Ford correctly noted that this requirement would mean that side-facing and rear-facing outboard seating positions would be required to be equipped with ELRs for the lap belts, even though side-facing and rear-facing outboard seating positions were expressly excluded from the lap/shoulder belt requirements. Ford asserted that this was a major change from the proposal, which had been limited to forward-facing outboard seating positions, and that insufficient leadtime had been permitted to allow it to install ELRs on the lap belt in its vehicles with side-facing seats (such as extended cab pickups) and rear-facing seats (such as station wagons).

Upon reconsideration, NHTSA has decided that this provision of the final rule was overly broad. The agency will examine the issue of whether it may be appropriate to amend the retractor requirements for side-facing or rear-facing outboard seating positions. If NHTSA decides to propose such an action, that proposal will be the subject of a separate rulemaking action. For this rulemaking action, however, the agency did not intend to establish or amend any requirements, including retractor requirements, for seating positions that are not forward facing or adjustable to a forward-facing position. *See* 54 FR 46258–46259; November 2, 1989. Therefore, in response to Ford's petition, this notice limits the retractor requirements of S7.1.1.3 to seating positions that are forward facing or adjustable to a forward-facing position.

The second prong of the final rule's approach to ensuring adult comfort and tight securing of child seats from the same belt systems was a new requirement that safety belts that incorporate an ELR in the lap belt or lap belt portion of a lap/shoulder belt shall provide some means, other than an external device requiring manual attachment or activation, that will prevent any further webbing from spooling out until that means is released or deactivated. This requirement, which was set forth in a new S7.1.1.5 of Standard No. 208, would allow safety belt systems equipped with an ELR to secure child seats as tightly as belt systems equipped with an ALR.

All but one of the fourteen petitioners for reconsideration objected to this new requirement in Standard No. 208. The two primary objections to this requirement did not relate to the merits of promoting the tight securing of child seats. First, the petitioners asserted that the NPRM had not given the public notice or opportunity to comment on such a requirement. Hence, according to this argument, the adoption of such a requirement in the final rule violated the informal rulemaking provisions set forth in the Administrative Procedure Act (5 U.S.C. 551 *et seq.*). Second, the petitioners asserted that the absence of any procedures for determining compliance with this requirement meant that the requirement was not stated in objective terms, as required

by the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1381 *et seq.*).

NHTSA has tentatively concluded anew that it is necessary and appropriate for Standard No. 208 to include a requirement to ensure that safety belt systems are both comfortable for adult users *and* can tightly secure child safety seats. In the November 2, 1989 final rule, the agency sought to achieve this purpose by means of S7.1.1.5. The petitioners for reconsideration did not address the fundamental questions of the necessity for and validity of the agency's underlying purpose. Instead, the petitioners focused exclusively on the means chosen to accomplish that purpose.

NHTSA wants to focus attention on the purpose of the requirement in S7.1.1.5 and away from the details of the means chosen to achieve that purpose. To do so, this rule removes S7.1.1.5 from Standard No. 208. Elsewhere in today's edition of the *Federal Register*, the agency has published a proposal to readopt S7.1.1.5. The proposed S7.1.1.5 includes an objective test procedure for determining compliance. The addition of the compliance test procedure and the opportunity to comment on this new regulatory requirement will eliminate the procedural objections raised in the petitions for reconsideration. Additionally, since S7.1.1.5 as promulgated in the November 1989 final rule was not scheduled to take effect until September 1991, this new notice and opportunity for comment will not result in any needless delays in establishing a new requirement for safety belts to be both comfortable for adult occupants and able to tightly secure child safety seats.

The Requirements With Which Rear Seat Lap/Shoulder Belts Must Comply For Readily Removable Seats. The November 1989 final rule included special provisions for lap/shoulder belts installed at rear outboard seating positions on readily removable seats. Such belts are permitted to detach at the upper anchorage only. If those belts are detachable at the upper anchorage, the means of detaching cannot include any sort of pushbutton release. Ford's petition for reconsideration asked that lap/shoulder belts on readily removable seats be permitted to detach at either the upper or lower anchorage and that the means of detachment should be permitted to include a pushbutton release.

In the final rule, the agency permitted lap/shoulder belts on readily removable rear seats to be detachable only at the upper anchorage point in response to comments by Ford and GM. Those manufacturers both commented that permitting lap/shoulder belts to be detachable at the upper anchorage would ease the problems of providing lap/shoulder belts at outboard seating positions on readily removable seats. After conducting its own analysis of this question, NHTSA concurred with these comments and adopted the requested provision.

However, in its petition for reconsideration, Ford asserted that limiting the detachment point to the upper anchorage point was "overly design restrictive." This was because, according to Ford, there was no safety reason for permitting the belt system to detach at the upper, but not the lower, shoulder belt anchorage point. While the agency believes there are legitimate safety reasons for permitting the belts to be detachable at only one point, there is no apparent safety purpose served by specifying that the single detachment point must be the upper, and not the lower, shoulder belt anchorage point. Accordingly, this notice amends Standard No. 208 to permit lap/shoulder safety belt systems installed at outboard seating positions on readily removable seats to detach at either the upper or lower shoulder belt anchorage, but not both.

Ford also asked in its petition that Standard No. 208 be amended to permit the means of detachment to be a pushbutton release. In the November 1989 final rule, NHTSA noted that S7.2 of Standard No. 208 has long required safety belt systems to use a *single* pushbutton buckle that releases the occupant from the lap belt and the shoulder belt simultaneously. Because of this requirement, the agency explained that manufacturers could *not* use a pushbutton release to detach the safety belt from the vehicle at an anchorage point, because the belt system would then have *two* pushbutton releases. The agency explained that the requirement for a single pushbutton release helped ensure that an occupant could not easily release either the lap belt or shoulder belt portion of the safety belt system and use only the unreleased portion of the safety belt system. Instead of a pushbutton release at the anchorage point where the safety belt detaches from the vehicle, the agency indicated that manufacturers could use a slide button or slide collar as the release.

Ford asked for reconsideration of this requirement, asserting that a slide button or slide collar release "tends to rattle and provides less control over . . . the fit of the shoulder belt." Even accepting these assertions as correct, NHTSA does not believe they are sufficient reason to permit the use of a pushbutton release as the means for detaching the lap/shoulder belt from the vehicle. As explained in the final rule and above, a pushbutton mechanism that detached a safety belt assembly from the vehicle at an anchorage point would increase the ease with which an occupant could detach either the lap belt or shoulder belt portion of the belt system and use only one part of the safety belt. The agency again concludes that a slide button or slide collar used as the means of detaching a shoulder belt will

permit the belt to be detached when the readily removable seat is removed, and minimize the possibility that an occupant will detach a portion of the lap/shoulder belt system when the readily removable seat is in place in the vehicle. To emphasize the agency's intent, express language has been added to the standard *prohibiting* the use of pushbutton mechanisms to detach lap/shoulder belt systems installed for readily removable seats. With respect to Ford's assertions that slide button or collar releases tend to rattle and present more problems for proper shoulder belt fit, NHTSA concludes that the manufacturers have sufficient engineering expertise to resolve such issues.

Ford asked in its petition for an additional year of leadtime for installing rear seat lap/shoulder belts at outboard positions on readily removable seats, if its request to use a pushbutton release to detach safety belts at such positions were denied. Ford stated that this extra leadtime was needed because it would now be required to make changes to its safety belt systems, the anchorages for those systems, and the seat structure of the readily removable seats to comply with the requirement for a single pushbutton release on a belt system. NHTSA believes that this request is reasonable. Ford's vehicles represent an appreciable percentage of the total number of vehicles equipped with readily removable seats, most notably the Aerostar and Econoline vans. These vehicles do not currently use, nor did Ford plan to begin using, a release mechanism that complies with the requirements that are scheduled to take effect on September 1, 1991. Accordingly, Ford will need to make the changes described in its petition. NHTSA has concluded that an additional year of leadtime is needed to allow Ford to make the necessary changes. Therefore, this notice delays the requirement for rear seat lap/shoulder belts to be installed at outboard seating positions on readily removable seats for one year, so that it now applies to vehicles manufactured on or after September 1, 1992.

Economic and Other Impacts of the November 1989 Final Rule

The Recreation Vehicle Industry Association (RVIA) filed a petition for reconsideration of the November 1989 final rule, based on the economic impacts that rule would have on vans, especially vans modified by final stage manufacturers and alterers. RVIA asked that vans with a gross vehicle weight rating (GVWR) of more than 6,000 pounds be excluded from the requirement for rear seat lap/shoulder belts, instead of the 10,000 pound GVWR cap that was established in the November 1989 final rule. The basis for this request was that there would be lesser safety benefits resulting from rear seat lap/shoulder belts in these vehicles (because the vehicles are "structurally stronger, larger and heavier than passenger cars") and higher costs to install those belts (because of the necessary structural modifications).

NHTSA has reexamined its previous decision in response to this request and determined that RVIA has not presented any reasons for changing the requirements of the previously published rule. Notwithstanding RVIA's general assertions about the differences between large vans and passenger cars, the 1988 fatality rate for large vans was slightly higher than the fatality rate for large cars. These comparative fatality rates show that RVIA's assertion that occupants of large vans have a lesser need for safety protection because of the structural differences between vans and cars is *not* borne out by real world experience.

The agency has acknowledged that the costs of installing rear seat lap/shoulder belts in vans will be greater than the costs of installing those safety belts in passenger cars, because vehicles other than passenger cars may need structural modifications to accommodate the shoulder belt portion of lap/shoulder belts at rear seating positions. However, the agency has concluded that the structural modifications generally do not pose any serious technical difficulties and that the safety benefits that would result from rear seat lap/shoulder belts in these vehicles were more than sufficient to justify the additional burden. *See* NHTSA's Final Regulatory Evaluation of this rule in Docket No. 87–08; Notice 5 and the discussion in the NPRM for this rule at 53 FR 47986; November 29, 1988. These agency conclusions were reached after a thorough consideration of all available data. RVIA's petition sets forth no additional evidence or other reasons to believe that the agency conclusions were wrong, so NHTSA has no basis for changing those conclusions in response to the RVIA petition.

Alternatively, RVIA asked that the rear seat lap/shoulder belt requirement be limited to vans that are within the weight limits established for dynamic testing of manual safety belts, i.e., a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. The justification for this request was the costs and burdens that would be imposed on van converters to equip rear outboard seating positions with lap/shoulder safety belts.

NHTSA has often acknowledged that final stage manufacturers and alterers lack the technical expertise and financial resources of the larger manufacturers. Because of the lesser technical and financial capabilities of the final stage manufacturers and alterers, the burdens associated with NHTSA's regulatory requirements will always be proportionally larger for these small entities than for the larger

manufacturers. Thus, the relevant question is not whether the burden is proportionally larger for these small entities, but instead whether the burden imposed by a new regulatory requirement is excessive for small entities.

When developing the final rule for rear seat lap/shoulder belts to be installed by small entities like van converters, NHTSA carefully considered the potential burdens the rule would impose on small businesses and determined that any such burdens would be relatively minor. All rear outboard seating positions already installed in the vehicles delivered to van converters for conversion must be equipped with rear seat lap/shoulder safety belts. Thus, if the van converter is not making any modifications to the seating position, it can simply leave in place the rear seat lap/shoulder belt assembly and anchorages installed by the original manufacturer of the vehicle. This imposes no burdens on the van converter.

If the van converter is adding a new rear outboard seating position, or modifying an existing outboard seating position, the van converter will be subject to some additional burdens, but those burdens are far from excessive. For all types of motor vehicles other than buses, manufacturers (including van converters) have long been required to install lap-only belts and anchorages for those belts at each designated seating position. To certify compliance with these requirements, van converters must now add two weldments or make some simple structural modifications for the lap belt anchorages and install a lap-only belt at every rear outboard seating position it adds to a conversion van. To install lap/shoulder belts, instead of lap-only belts, at those seating positions, the van converter must add an additional weldment or make an additional simple structural modification and install a lap/shoulder belt in place of the lap-only belt. This added burden does not require any additional engineering expertise or crash testing. In the Final Regulatory Evaluation that accompanied the November 1989 final rule, NHTSA estimated that the rear seat lap/shoulder belt requirement would increase costs by $13 for each rear outboard seating position in these vehicles. NHTSA concluded that these burdens are not excessive, and RVIA provided no information indicating either that this previous agency conclusion was wrong or that NHTSA had failed to consider some relevant information in reaching this conclusion. Accordingly, RVIA's petition to amend the rear seat lap/shoulder belt requirements is denied.

RVIA also challenged NHTSA's certification that the rear seat lap/shoulder belt rule will not have a significant economic impact on a substantial number of small entities. RVIA noted that a publication identifies more than 2,600 van converters in the United States. However, NHTSA's certification was based upon the fact that the rear seat lap/shoulder belt requirements will *not* have a significant economic impact on small entities, as explained above, regardless of the number of small entities that will be affected.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

1. S4.1.4 of Standard No. 208 is amended by revising S4.1.4.2(b), adding a new S4.1.4.2(c), and revising S4.1.4.2.2, to read as follows:

S4.1.4 *Passenger cars manufactured on or after September 1, 1989.*

* * * * *

S4.1.4.2 (a) * * *

(b) Except as provided in S4.1.4.2.1 and S4.1.4.2.2, each passenger car, other than a convertible, manufactured on or after September 1, 1990 and each convertible passenger car manufactured on or after September 1, 1991 shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR §571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

(c) As used in this section, "rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating position adjacent to a walkway that is located between the seat and the near side of the vehicle and is designed to allow access to more rearward seating positions.

S4.1.4.2.1 * * * * *

S4.1.4.2.2 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.1.4.2 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action.

2. S4.2.4 of Standard No. 208 is amended by revising the introductory text and S4.2.4.3 to read as follows:

S4.2.4 *Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with*

a GVWR of 10,000 pounds or less. Except as provided in S4.2.4.2 and S4.2.4.3, each truck and each multipurpose passenger vehicle, other than a motor home, manufactured on or after September 1, 1991 that has a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR §571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

* * * * *

S4.2.4.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.2.4 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action.

3. S4.4.3 of Standard No. 208 is amended by revising S4.4.3.2 and S4.4.3.2.3 to read as follows:

S4.4.3 *Buses manufactured on or after September 1, 1991.*

* * * * *

S4.4.3.2 Except as provided in S4.4.3.2.2 and S4.4.3.2.3, each bus with a gross vehicle weight rating of 10,000 pounds or less, except a school bus, shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the front and every rear forward-facing outboard designated seating position, and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR §571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

* * * * *

S4.4.3.2.3 Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.4.3.2 and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action.

* * * * *

4. S7.1.1.3 of Standard No. 208 is revised to read as follows:

S7.1.1.3 A Type 1 lap belt or the lap belt portion of any Type 2 seat belt assembly installed at any forward-facing outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less to comply with a requirement of this standard, except walk-in van-type vehicles and school buses, shall meet the requirements of S7.1 by means of an emergency locking retractor that conforms to Standard No. 209 (49 CFR §571.209).

5. S7.1.1.5 of Standard No. 208 is removed and reserved.

Issued on July 25, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 30914
July 30, 1990

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 208

Crash Tests With Unrestrained Dummies
(Docket 74-14; Notice 66)
RIN 2127-AC13

ACTION: Interim final rule with request for comments.

SUMMARY: This rule amends Standard No 208, *Occupant Crash Protection*, by extending the period during which a Hybrid II test dummy will be the only dummy used in compliance tests of vehicles that employ means other than safety belts or air bags to meet the standard. The standard had formerly provided that a Hybrid III test dummy could be used to test such a vehicle manufactured on or after September 1, 1990. This rule delays the use of the Hybrid III test dummy for compliance testing of such vehicles until September 1, 1993. This additional time is needed to allow the agency to complete and evaluate the many research projects that are now underway examining the Hybrid III test dummy. Once this has been done the agency will be able to establish requirements for the use of Hybrid III test dummies that will ensure both that vehicles that do not use safety belts or air bags will provide adequate protection for drivers and passengers in actual crashes and that the Hybrid III test dummy is equivalent to the Hybrid II test dummy in these situations. This rule does not affect the requirement that vehicle manufacturers have the option of specifying the use of either the Hybrid II or the Hybrid III test dummy in compliance testing of vehicles that use either air bags or safety belts to meet the standard.

DATES: *Effective date*: This rule takes effect on September 26,1990.

SUPPLEMENTARY INFORMATION:

Background. The Hybrid II test dummy has been incorporated in Subpart B of 49 CFR Part 572 since August 1, 1973. This test dummy is used to assess the occupant protection afforded vehicle occupants in frontal crashes. To serve this purpose, instruments in the dummy measure the acceleration at the center of gravity of the dummy's head, the acceleration at the center of gravity of the dummy's upper thorax (chest), and the compressive force transmitted axially through each upper leg. These forces cannot exceed the maximum levels set forth in Standard No. 208, *Occupant Crash Protection*. NHTSA had concluded that the Hybrid II test dummy was a reasonable simulation of a human. The maximum force levels set forth in Standard No. 208 were set at levels that would minimize the likelihood of serious injury or death for vehicle occupants in frontal crashes.

For more than a decade, the Hybrid II test dummy was the only test dummy specified in NHTSA's regulations for use in Standard No. 208 compliance testing. However, on July 25, 1986 (51 FR 26688), NHTSA published a rule establishing a second test dummy for use in Standard No. 208 compliance testing. This test dummy was the Hybrid III test dummy, and the specifications for it appear at Subpart E of 49 CFR Part 572. The agency concluded that this test dummy would allow the assessment of more types of potential injuries to vehicle occupants and that this test dummy appeared to be an even more accurate simulation of a human than the older Hybrid II test dummy. The rule establishing the Hybrid III test dummy for use in compliance testing required that the same force levels that are measured and recorded for the Hybrid II test dummy would be measured and recorded for the Hybrid III test dummy, and that the same maximum injury criteria levels would apply to both types of test dummies.

When either of two types of test dummies may be used for compliance testing for a safety standard, it is important that the two types be "equivalent," i.e., that they display only minimal differences in test results when they are exposed to equivalent crash environments. The importance of equivalence is that vehicles, which will pass or fail a safety standard using one type of dummy, will achieve essentially the same result using the other type of dummy. This ensures that compliance or noncompliance with a safety standard is entirely dependent upon vehicle attributes instead of differing attributes of the types of test dummies.

When the Hybrid III test dummy was incorporated into Part 572, NHTSA concluded that the Hybrid II and III test dummies were equivalent when the dummies were restrained by safety belts or air bags. However, the agency concluded that the two types of test dummies were *not* equivalent when they were

unrestrained. The chest acceleration measurements for unrestrained Hybrid III dummies were consistently lower than the chest acceleration measurements for unrestrained Hybrid II dummies. If the two test dummies were to be equivalent when they were unrestrained, some measurement of injury producing forces to the chest of the Hybrid III test dummy, in addition to the existing measurement of chest acceleration, would have to be made to compensate for the lower chest acceleration measurements for unrestrained Hybrid III test dummies. Chest injuries generally are caused by excessive loading on the chest, when the chest contacts the restraint system and possibly the steering system, if the occupant is restrained, or the steering system and/or other passenger compartment components, if the occupant is unrestrained. The agency concluded that a measurement of the amount the chest was deflected, or compressed, as measured approximately at the sternum, for the Hybrid III test dummy would appropriately compensate for that dummy's lower chest acceleration measurements when it was unrestrained. Hence, a limit was established on the amount of chest deflection permitted when the Hybrid III test dummy was used in compliance testing.

Both the notice of proposed rulemaking and the final rule adopting the Hybrid III test dummy divided all occupant protection systems into two groups. One chest deflection limit (3.0 inches) was established for air bags ("restraint systems that are gas inflated and provide distributed loading to the torso during a crash") and another chest deflection limit (2.0 inches) was established for all other occupant protection systems. The effect of this latter chest deflection limit was to treat as a single category vehicles in which occupants were restrained by safety belts and vehicles in which occupants were unrestrained. Subsequently, the agency determined that the limited data that were available called into question the wisdom of treating safety-belt restrained and unrestrained occupants as a single group for the purposes of the chest deflection limit.

Reponse to Petitions for Reconsideration of the Rule Establishing the Hybrid III Test Dummy. In response to the petitions for reconsideration of the final rule establishing the Hybrid III test dummy, NHTSA reexamined its previous decision to establish a single chest deflection limit for all occupant protection systems other than air bags. The available accident data suggested that, when the crash forces that produce as much as 2.9 inches of chest deflection in the Hybrid III test dummy are imposed on the human chest by 2-point safety belts, those forces appear not to expose vehicle occupants to a significant risk of serious chest injury. Since the agency had treated occupants restrained by safety belts in the same category as those that were unrestrained for the purposes of the chest deflection limit, one would infer that the same level of chest deflection that appeared not to expose safety belt-restrained occupants to significant risks of serious chest injury would likewise not expose unrestrained occupants to significant risks of serious chest injury. However, the accident data and the limited biomechanical data that were available for unrestrained occupants raised concerns about such an inference.

Further, as explained above, NHTSA was concerned that the Hybrid II and Hybrid III test dummies be equivalent. None of the limited data that were available suggested that a 3 inch chest deflection limit for unrestrained test dummies would make the Hybrid III equivalent to the Hybrid II test dummies in those situations. Because of these concerns, the agency concluded that it should not permit the Hybrid III test dummy to be used for compliance testing with the automatic crash protection requirements of vehicles manufactured before September 1, 1990, which used means other than air bags or automatic safety belts to provide the automatic protection. To the best of the agency's knowledge, no manufacturer had any plans to certify a vehicle design as complying with the automatic crash protection requirements without using automatic safety belts or air bags. Hence, this temporary delay in the use of the Hybrid III test dummy for such vehicles was more significant in theory than in practice. NHTSA stated in the 1988 response to the petitions for reconsideration of the Hybrid III rulemaking that delaying until September 1, 1990 would be sufficient to allow the agency to investigate this subject further, to ensure that the chest deflection limit that would be established for unrestrained Hybrid III test dummies would both meet the need for safety and ensure equivalence of the Hybrid II and Hybrid III test dummies in unrestrained conditions.

Activities After the Response to Petition for Reconsideration. At the time of the March 1988 response to petitions for reconsideration, the agency anticipated that the research needed to determine the appropriate chest deflection limit for unrestrained occupants would be completed early enough to allow the agency to make that determination by September 1, 1990. This anticipation reflected NHTSA's belief that the primary tasks of the research activities would be to develop more sophisticated and suitable instrumentation systems for measuring chest deflection and reviewing the existing biomechanical research to determine what chest deflection limit should be established. NHTSA promptly undertook research to address these tasks.

The research undertaken by the agency and test data received from sources outside the agency, including General Motors, Mercedes-Benz, Toyota, INRETS (a French government research and development group), and the Motor Industry Research Association (a British

group), have shown that chest deflection dynamics within the Hybrid III test dummy are far more complex than the agency originally believed and that more sophisticated and suitable instrumentation systems would need to be developed to provide measurements of kinematic distortions of the dummy ribcage. In spite of these unexpected complexities, the agency believes it has developed instrumentation that could be of immediate use. However, the research and test data also raised more basic questions about biomechanical shortcomings of the existing thoracic structure of the Hybrid III test dummy. These biomechanical questions cannot yet be answered, as explained below.

Copies of the testing and research reports describing the testing and research of which the agency is aware and that have become available since March 1988 has been placed in the public docket for this rulemaking. Interested persons are advised to examine those documents for more details on the agency's testing and the results of testing by other entities.

The review of existing biomechanical research and the additional information that has become available since March 19BB raised questions about the suitability of evaluating the potential for thorax injury to vehicle occupants by means of a single point measurement of chest deflection. Test data now indicate that the Hybrid III dummy's centrally located chest deflection sensor measures actual chest deflection only when the load is symmetrically distributed around the chest deflection sensor in the plane of the sternum and when the dummy's chest moves primarily along a single axis, such as a forward-rearward direction, as is generally the case when the dummy is restrained by either a safety belt or an air bag. Agency tests and the test conducted by INRETS show that the existing deflection sensor does not appear to measure true thorax penetration when the thorax is subJected to loading that is concentrated in a small area, when the loading is not symmetrical, or when the impact with the thorax is off-center. The Toyota testing indicated that shifting the positioning of the shoulder belt relative to the Hybrid III dummy's chest deflection sensor affects the measured deflection value and may not indicate the true magnitude of the deflection that occurs.

In response to these questions, NHTSA initiated research to try to develop either supplementary or alternative technologies for measuring chest deflection in the Hybrid III test dummy. This research allowed the agency to develop two alternative technologies for measuring chest deflection. The first approach measures chest deflection by using string potentiometers at eight points mounted internally around the test dummy's thorax. The second approach consisted of developing an instrumented chestband called an External Peripheral Instrument for Deformation Measurement (EPIDM). NHTSA developed the EPIDM because of the extreme difficulties in measuring chest deflection levels of the cadaver thorax during impacts in vehicle crash environments. In addition to these agency research efforts, NHTSA has learned that Mercedes-Benz is exploring methods of determining chest deflections by measuring the strain imposed on the ribs during the impact.

Further, the Society of Automotive Engineers Committee on Human Biomechanics Simulation formed a task force on September 1, 1988. The mandate of this task force is to evaluate, compare, and recommend for practical application appropriate chest deflection measuring technologies. That task force is currently reviewing several existing methods to measure chest deflection in the Hybrid III test dummy At this time, the agency understands that this task force expects to reach conclusions and make its recommendations by early 1991.

If the agency had been correct in its March 1988 belief that all that was needed to make the Hybrid III test dummy acceptable for use in testing unrestrained occupants was to develop more sophisticated and suitable instrumentation systems for measuring chest deflection, no additional postponement of the use of Hybrid III for testing unrestrained occupants would be needed. The eight-point chest deflection measurement could be proposed for use now, and the EPIDM and Mercedes' approach might enhance the measurement capabilities in the future. However, test data, particularly the INRETS and Toyota studies referenced earlier, that have become available since March 1988, have suggested shortcomings in the biofidelity of the Hybrid III thorax as it interacts with typical restraint systems.

In response to these data, NHTSA and other parties have undertaken biomechanical research to verify or disprove these studies and to determine if modifications to the Hybrid III thorax could address the problems suggested by the INRETS and Toyota data. The agency has placed in the docket for this rulemaking action a document listing those research activities relevant to the appropriate chest deflection limit for unrestrained Hybrid III test dummies that have been completed since March 19BB and those that are planned in the near future, both by this agency and by outside parties. The biomechanical research that is now necessary is far more complex and time-consuming than the research the agency anticipated was needed in March 1988. Additionally, biomechanical research is paced by the scarcity of cadavers for use in the testing. Accordingly, it was not possible for NHTSA to satisfactorily resolve the issue of the Hybrid III test dummy in unrestrained situations by September 1, 1990.

Requirements of and Need for this Interim Final Rule. The testing NHTSA now has planned or in

preliminary assessment of the test data available by the end of 1992. As this research progresses, it may be determined that the current Hybrid III thorax design will be shown to be adequate, if it includes new chest deflection measurement instrumentation with an appropriate chest deflection limit for unrestrained occupants. Alternatively, the Hybrid III thorax structure may be shown to need further refinements for use in certain types of crash loading situations, such as unrestrained. In that case, if alternative thorax designs are available and the alternative designs appear to overcome the problems of the current Hybrid III thorax in those crash loading situations, the agency would propose to incorporate those alternative designs into the Hybrid III test dummy. If the research program is unable to uncover solutions to any identified shortcomings, the agency would have to determine the most appropriate course of action.

Regardless of which of these scenarios eventually comes to pass, the results of the research program will enable the agency to determine the most appropriate course of action. That research program will be completed by December 1992. Hence, NHTSA believes that it will be able to determine the most appropriate course of action and complete the necessary rulemaking actions by September 1, 1993. The agency has also concluded that the public interest would be best served by prohibiting the use of the Hybrid III test dummy in crash situations where it would be unrestrained, until NHTSA has determined the appropriate chest deflection limits and measurement techniques for the Hybrid III test dummy in those crash situations. Accordingly, this rule specifies that any vehicles manufactured before September 1, 1993 that comply with the automatic restraint requirement without using any type of safety belt or inflatable restraint must use only the Hybrid II test dummy in testing for compliance with the automatic restraint requirement.

The agency finds for good cause that notice and opportunity for comment on this rule before it becomes effective would be impracticable and contrary to the public interest, as explained below. First, the circumstances that have forced this postponement were beyond the agency's control. In this instance, the agency did not anticipate that its research program would raise substantial biomechanical issues with respect to the Hybrid III thorax, nor was there an available body of data indicating that these results were likely. Since neither the need for, nor the appropriate direction of, the additional research were known to NHTSA or any other party, NHTSA had no influence or control over those circumstances.

Second, the agency acted diligently to initiate the supplemental biomechanical testing and to try to devise modifications to the Hybrid III thorax that would have allowed this test dummy to be used for compliance testing in unrestrained situations. However, the magnitude of the biomechanical issues that have become apparent was too great to allow the agency to propose an effective solution at this time.

Third, the agency announced in its 1988 final rule that Hybrid III test dummies could be used in unrestrained testing of vehicles manufactured on or after September 1, 1990. NHTSA fully intended to permit the Hybrid III to be used for unrestrained testing, even though the agency thought it might act at a later date to lower the chest deflection limit for the Hybrid III test dummy when unrestrained. This intention reflected the agency's belief that the basic approach of using chest deflection measurements on the Hybrid III dummy would ensure acceptable protection against thoracic injury for unrestrained vehicle occupants in real world situations, even if the permissible amount of chest deflection were subsequently lowered for unrestrained occupants. However, the available research now suggests that chest deflection measurements on the Hybrid III dummy may not be an acceptable approach to ensuring safety protection for unrestrained vehicle occupants. Since ensuring occupant safety is NHTSA's mission, this recently available research has forced the agency to alter its previously announced intent on this subject.

Fourth, the postponement of the use of the Hybrid III test dummy in unrestrained situations is for a relatively short time, until September 1, 1993. Vehicle manufacturers have already begun the preliminary work on their 1993 models that will be produced before September 1, 1993. NHTSA is not aware of any manufacturer that plans to produce a 1993 model that does not rely on either safety belts or air bags to provide occupant protection. Thus, no manufacturer will have to change its plans in response to this postponement. On the other hand, this issue will be resolved quickly enough to allow manufacturers that wish to pursue development of occupant protection systems that do not use safety belts or air bags to proceed expeditiously.

Fifth, NHTSA will consider all comments that are received on this subject and promptly publish a permanent final rule reflecting NHTSA's evaluation of those comments. To the extent that this interim final rule imposes any unforeseen burdens or otherwise affects some party, the permanent final rule will promptly resolve that problem.

After considering all these factors together, NHTSA has concluded that good cause exists to dispense with notice and comment before this interim final rule takes effect. This same good cause justifies making this final rule effective upon publication in the *Federal Register*, instead of 30 days after publication.

In Consideration of the foregoing, 49 CFT Part 571 is amended as follows:

S5 of Standard No.208 is amended by revising the introductory text of S5.1 and the introductory text of S5.2.1, to read as follows:

S5. Occupant crash protection requirements.

S5.1 Vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt or inflatable restraint shall comply with S5.1(a).

* * * * *

S5.2 Lateral moving barrier crash test.

S5.2.1 Vehicles subject to S5.2 shall comply with either S5.2.1(a) or S5.2.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(c) by means not including any type of seat belt or inflatable restraint shall comply with S5.2.1(a).

* * * * *

Issued on: October 31, 1990.

Jerry Ralph Curry
Administrator

55 F.R. 39280
September 26, 1990

MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69-7; Notice No. 9)

S1. Scope. This standard specifies performance requirements for the protection of vehicle occupants in crashes.

S2. Purpose. The purpose of this standard is to reduce the number of deaths of vehicle occupants and the severity of injuries, by specifying vehicle crashworthiness requirements in terms of forces and accelerations measured on anthropomorphic dummies in test crashes, and by specifying equipment requirements for active and passive restraint systems.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses. In addition, S9, *Pressure vessels and explosive devices,* applies to vessels designed to contain a pressurized fluid or gas, and to explosive devices, for use in the above types of motor vehicles as part of a system designed to provide protection to occupants in the event of a crash.

S4. General requirements.

S4.1 Passenger cars.

S4.1.1 Passenger cars manufactured from January 1, 1972, to August 31, 1973. Each passenger car manufactured from January 1, 1972, to August 31, 1973, inclusive, shall meet the requirements of S4.1.1.1, S4.1.1.2, or S4.1.1.3. A protection system that meets the requirements of S4.1.1.1 or S4.1.1.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.1.3.

S4.1.1.1 First option—complete passive protection system. The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.1.1.2 Second option—lap belt protection system with belt warning. The vehicle shall—

(a) At each designated seating position have a Type 1 seat belt assembly or a Type 2 seat belt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard;

(b) At each front outboard designated seating position have a seat belt warning system that conforms to S7.3; and

(c) Meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with respect to anthropomorphic test devices in each front outboard designated seating position restrained only by Type 1 seat belt assemblies.

S4.1.1.3 Third option—lap and shoulder belt protection system with belt warning.

S4.1.1.3.1 Except for convertibles and open-body vehicles, the vehicle shall—

(a) At each front outboard designated seating position have a Type 2 seat belt assembly that conforms to Standard No. 209 and S7.1 and S7.2 of this standard, with either an integral or detachable upper torso portion, and a seat belt warning system that conforms to S7.3;

(b) At each designated seating position other than the front outboard positions, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2 of this standard; and

(c) When it perpendicularly impacts a fixed collision barrier, while moving longitudinally forward at any speed up to and including 30 m.p.h., under the test conditions of S8.1 with anthropomorphic test devices at each front outboard position restrained by Type 2 seat belt assemblies, experience no complete separation of any load-bearing element of a seat belt assembly or anchorage.

S4.1.1.3.2 Convertibles and open-body type vehicles shall at each designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2 of this standard, and at each front outboard designated seating position have a seat belt warning system that conforms to S7.3.

S4.1.2 Passenger cars manufactured on or after September 1, 1973, and before September 1, 1986. Each passenger car manufactured on or after September 1, 1973, and before September 1, 1986, shall meet the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3.

A protection system that meets the requirements of S4.1.2.1 or S4.1.2.2 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.1.2.3.

S4.1.2.1 First option—frontal/angular automatic protection system. *The vehicle shall—*

(a) At each front outboard designated seating position meet the frontal crash protection requirements of S5.1 by means that require no action by vehicle occupants;

(b) At each front center designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 and S7.2; and

(c) *Either—*

(1) Meet the lateral crash protection requirements of S5.2 and the rollover crash protection requirements of S5.3 by means that require no action by vehicle occupants; *or*

(2) At each front outboard designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 and to S7.1 through S7.3, and that meets the requirements of S5.1 with front test dummies as required by S5.1, restrained by the Type 1 or Type 2 seat belt assembly (or the pelvic portion of any Type 2 seat belt assembly which has a detachable upper torso belt) in addition to the means that require no action by the vehicle occupant.

S4.1.2.2 Second option—head-on automatic protection system. The vehicle shall—

(a) At each designated seating position have a Type 1 seat belt assembly or a Type 2 seat belt assembly with a detachable upper torso portion that conforms to S7.1 and S7.2 of this standard.

(b) At each front outboard designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, by means that require no action by vehicle occupants;

(c) At each front outboard designated seating position, meet the frontal crash protection requirements of S5.1, in a perpendicular impact, with a test device restrained by a Type 1 seat belt assembly; and

(d) At each front outboard designated seating position, have a seat belt warning system that conforms to S7.3.

S4.1.2.3 Third option—lap and shoulder belt protection system with belt warning.

S4.1.2.3.1 Except for convertibles and open-body vehicles, the vehicle shall—

(a) At each front outboard designated seating position have a seat belt assembly that conforms to S7.1 and S7.2 of this standard, and a seat belt warning system that conforms to S7.3. The belt assembly shall be either a Type 2 seat belt assembly with a nondetachable shoulder belt that conforms to Standard No. 209 (S571.209), or a Type 1 seat belt assembly such that with a test device restrained by the assembly the vehicle meets the frontal crash protection requirements of S5.1 in a perpendicular impact.

(b) At any center front designated seating position, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (S571.209) and to S7.1 and S7.2 of this standard, and a seat belt warning system that conforms to S7.3; and

(c) At each other designated seating position, have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (S571.209) and S7.1 and S7.2 of this standard.

S4.1.2.3.2 Convertibles and open-body type vehicles shall at each designated seating position have a Type 1 or Type 2 seat belt assembly that conforms to Standard No. 209 (S571.209) and to S7.1 and S7.2 of this standard, and at each front designated seating position have a seat belt warning system that conforms to S7.3.

S4.1.3 Passenger cars manufactured on or after September 1, 1986, and before September 1, 1989.

S4.1.3.1 Passenger cars manufactured on or after September 1, 1986, and before September 1, 1987.

S4.1.3.1.1 Subject to S4.1.3.1.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1986, and before September 1, 1987, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

[A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard. **(51 F.R. 9801—March 21, 1986. Effective: May 5, 1986)**]

S4.1.3.1.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars, specified in S4.1.3.1.1 complying with the requirements of S4.1.2.1 shall not be less than 10 percent of:

(a) the average annual production of passenger cars manufactured on or after September 1, 1983, and before September 1, 1986, by each manufacturer, or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.1.1.

[**S4.1.3.1.3** A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.1.2(a) or its annual production under S4.1.3.1.2(b). **(51 F.R. 37028—October 17, 1986. Effective: November 17, 1986.)**]

S4.1.3.2 Passenger cars manufactured on or after September 1, 1987, and before September 1, 1988.

S4.1.3.2.1 Subject to S4.1.3.2.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1987, and before September 1, 1988, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.1.3.2.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars specified in S4.1.3.2.1 complying with the requirements of S4.1.2.1 shall be not less than 25 percent of:

(a) the average annual production of passenger cars manufactured on or after September 1, 1984, and before September 1, 1987, by each manufacturer, or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.2.1.

[**S4.1.3.2.3** A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.2.2(a) or its annual production under S4.1.3.2.2(b). **(51 F.R. 37028—October 17, 1986. Effective: November 17, 1986.)**]

S4.1.3.3 Passenger cars manufactured on or after September 1, 1988, and before September 1, 1989.

S4.1.3.3.1 Subject to S4.1.3.3.2 and S4.1.3.4, each passenger car manufactured on or after September 1, 1988, and before September 1, 1989, shall comply with the requirements of S4.1.2.1, S4.1.2.2 or S4.1.2.3.

A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.1.3.3.2 Subject to S4.1.3.4 and S4.1.5, the amount of passenger cars specified in S4.1.3.3.1 complying with the requirements of S4.1.2.1 shall be not less than 40 percent of:

(a) the average annual production of passenger cars manufactured on or after September 1, 1985, and before September 1, 1988, by each manufacturer or

(b) the manufacturer's annual production of passenger cars during the period specified in S4.1.3.3.1.

[**S4.1.3.3.3** A manufacturer may exclude convertibles which do not comply with the requirements of S4.1.2.1, when it is calculating its average annual production under S4.1.3.3.2(a) or its annual production under S4.1.3.3.2(b). **(51 F.R. 37028—October 17, 1986. Effective: November 17, 1986.)**]

S4.1.3.4 Calculation of complying passenger cars.

(a) For the purposes of calculating the numbers of cars manufactured under S4.1.3.1.2, S4.1.3.2.2, or S4.1.3.3.2 to comply with S4.1.2.1:

(1) each car whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose front right seating position will comply with the requirements of S4.1.2.1(a) by any means is counted as 1.5 vehicles, and

(2) each car whose driver's seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front seat seating position is equipped with a manual Type 2 seat belt is counted as one vehicle.

(b) For the purposes of complying with S4.1.3.1.2, a passenger car may be counted if it:

(1) is manufactured on or after September 1, 1985, but before September 1, 1986, and

(2) complies with S4.1.2.1.

(c) For the purposes of complying with S4.1.3.2.2, a passenger car may be counted if it:

(1) is manufactured on or after September 1, 1985, but before September 1, 1987,

(2) complies with S4.1.2.1, and

(3) is not counted toward compliance with S4.1.3.1.2.

(d) For the purposes of complying with S4.1.3.3.2, a passenger car may be counted if it:

(1) is manufactured on or after September 1, 1985, but before September 1, 1988,

(2) complies with S4.1.2.1, and

(3) is not counted toward compliance with S4.1.3.1.2 or S4.1.3.2.2.

S4.1.3.5 Passenger cars produced by more than one manufacturer.

S4.1.3.5.1 For the purposes of calculating average annual production of passenger cars for each manufacturer and the amount of passenger cars manufactured by each manufacturer under S4.1.3.1.2, S4.1.3.2.2 or S4.1.3.3.2, a passenger car produced by more than one manufacturer shall be attributed to a single manufacturer as follows, subject to S4.1.3.5.2:

(a) A passenger car which is imported shall be attributed to the importer.

(b) A passenger car manufactured in the United States by more than one manufacturer, one of which also markets the vehicle, shall be attributed to the manufacturer which markets the vehicle.

S4.1.3.5.2 A passenger car produced by more than one manufacturer shall be attributed to any one of the vehicle's manufacturers specified by an express written contract, reported to the National Highway Traffic Safety Administration under 49 CFR Part 585, between the manufacturer so specified and the manufacturer to which the vehicle would otherwise be attributed under S4.1.3.5.1.

S4.1.4 Passenger cars manufactured on or after September 1, 1989.

S4.1.4.1 Except as provided in S4.1.4.2, each passenger car manufactured on or after September 1, 1989, shall comply with the requirements of S4.1.2.1. Any passenger car manufactured on or after September 1, 1989 and before September 1, 1993 whose driver's designated seating position complies with the requirements of S4.1.2.1(a) by means not including any type of seat belt and whose right front designated seating position is equipped with a manual Type 2 seat belt so that the seating position complies with the occupant crash protection requirements of S5.1, with the Type 2 seat belt assembly adjusted in accordance with S7.4.2, shall be counted as a vehicle complying with S4.1.2.1. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not know in the exercise of due care that such vehicle is not in conformity with this standard.

S4.1.4.2 (a) Each passenger car, other than a convertible, manufactured before December 11, 1989 may be equipped with, and each passenger car, other than a convertible, manufactured on or after December 11, 1989 and before September 1, 1990 shall be equipped with a Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed pursuant to this provision shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1.1 of this standard.

(b) [Except as provided in S4.1.4.2.1 and S4.1.4.2.2, each passenger car, other than a convertible, manufactured on or after September 1, 1990 and each convertible passenger car manufactured on or after September 1, 1991 shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR § 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)**

[(c) As used in this section, "rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating position adjacent to a walkway that is located between the seat and the near side of the vehicle and is designated to allow access to more rearward seating position. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)]**

S4.1.4.2.1 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either:

(i) meet the requirements of S4.1.4.2 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle and when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.1.4.2.2 [Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.1.4.2, and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)]**

S4.1.5 Mandatory seatbelt use laws.

S4.1.5.1 If the Secretary of Transportation determines, by not later than April 1, 1989, that state mandatory safety belt usage laws have been enacted that meet the criteria specified in S4.1.5.2 and that are applicable to not less than two-thirds of the total population of the 50 states and the District of Columbia (based on the most recent Estimates of the Resident Population of States, by Age, Current Population Reports, Series P–25, Bureau of the Census), each passenger car manufactured under S4.1.3 or S4.1.4 on or after the date of that determination shall comply with the requirements of S4.1.2.1, S4.1.2.2, or S4.1.2.3.

S4.1.5.2 The minimum criteria for state mandatory safety belt usage laws are:

(a) Require that each front seat occupant of a passenger car equipped with safety belts under Standard No. 208 has a safety belt properly fastened about his or her body at all times when the vehicle is in forward motion.

(b) If waivers from the safety belt usage requirement are to be provided, permit them for medical reasons only.

(c) Provide for the following enforcement measures:

(1) A penalty of not less than $25.00 (which may include court costs) for each occupant of a car who violates the belt usage requirement.

(2) A provision specifying that the violation of the belt usage requirement may be used to mitigate damages with respect to any person who is involved in a passenger car accident while violating the belt usage requirement and who seeks in any subsequent litigation to recover damages for injuries resulting from the accident. This requirement is satisfied if there is a rule of law in the State permitting such mitigation.

(3) A program to encourage compliance with the belt usage requirement.

(d) An effective date of not later than September 1, 1989.

S4.2 Trucks and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less.

S4.2.1 Trucks and multipurpose passenger vehicles, with a GVWR of 10,000 pounds or less, manufactured on or after January 1, 1976 and before September 1, 1991. Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 10,000 pounds or less, manufactured before September 1, 1991, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that forward control vehicles manufactured prior to September 1, 1981, convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carring chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

S4.2.1.1 First option—complete automatic protection system. The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.2.1.2 Second option—belt system. The vehicle shall have seat belt assemblies that conform to Standard 209 installed as follows:

(a) A Type 1 or Type 2 seat belt assembly shall be installed for each designated seating position in convertibles, open-body type vehicles, and walk-in van-type trucks.

(b) In all vehicles except those for which requirements are specified in S4.2.1.2(a), a Type 2 seat belt assembly shall be installed for each outboard designated seating position that includes the windshield header within the head impact area, and a Type 1 or Type 2 seat belt assembly shall be installed for each other designated seating position.

S4.2.2 Trucks and multipurpose passenger vehicles with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991. Each truck and multipurpose passenger vehicle, with a gross vehicle weight rating of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less, manufactured on or after September 1, 1991, shall meet the requirements of S4.1.2.1, or at the option of the manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2. Each Type 2 seat belt assembly installed in a front outboard designated seating position in accordance with S4.1.2.3. shall meet the requirements of S4.6.

S4.2.3 Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with either a GVWR of more than 8,500 pounds but not greater than 10,000 pounds or with an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less. Each truck and multipurpose passenger vehicle manufactured on or after September 1, 1991, that has either a gross vehicle weight rating which is greater than 8,500 pounds, but not greater than 10,000 pounds, or has an unloaded vehicle weight greater than 5,500 pounds and a GVWR of 10,000 pounds or less shall meet the requirements of S4.1.2.1, or at the option of manufacturer, S4.1.2.2 or S4.1.2.3 (as specified for passenger cars), except that convertibles, open-body type vehicles, walk-in van-type trucks, motor homes, vehicles designed to be exclusively sold to the U.S. Postal Service, and vehicles carrying chassis-mount campers may instead meet the requirements of S4.2.1.1 or S4.2.1.2.

NOTE: *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991)*

S4.2.4 Trucks and multipurpose passenger vehicles manufactured on or after September 1, 1991 with a GVWR of 10,000 pounds or less. [Except as provided in S4.2.4.2 and S4.2.4.3, each truck and each multipurpose passenger vehicle, other than a motor home, manufactured on or after September 1, 1991 that has a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at every forward-facing rear outboard designated seating position. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)]**

S4.2.4.1 As used in this section—

(a) "Motor home" means a motor vehicle with motive power that is designed to provide temporary residential accommodations, as evidenced by the presence of at least four of the following facilities: cooking; refrigeration or ice box; self-contained toilet; heating and/or air conditioning; a potable water supply system including a faucet and a sink; and a separate 110-125 volt electrical power supply and/or an LP gas supply.

(b) "Rear outboard designated seating position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seat(s), except any designated seating positions adjacent to a walkway located between the seat and the side of the vehicle, which walkway is designed to allow access to more rearward seating positions.

S4.2.4.2 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either:

(i) meet the requirements of S4.2.4 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any position in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of the Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.2.4.3 [Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after September 1, 1992 shall meet the requirements of S4.2.4, and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbotton action. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)]**

S4.3 Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds.

S4.3.1 Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds, manufactured on or after January 1, 1972 and before September 1, 1990. Each truck and multipurpose

passenger vehicle with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after January 1, 1972 and before September 1, 1990, shall meet the requirements of S4.3.1.1 or S4.3.1.2. A protection system that meets the requirements of S4.3.1.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.1.2.

S4.3.1.1 First option—complete passenger protection system. The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.3.1.2 Second option—belt system. The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209.

S4.3.2 Trucks and multipurpose passenger vehicles with a GVWR of more than 10,000 pounds manufactured on or after September 1, 1990. Each truck and multipurpose passenger vehicle with a gross vehicle weight rating of more than 10,000 pounds, manufactured on or after September 1, 1990, shall meet the requirements of S4.3.2.1 or S4.3.2.2. A protection system that meets the requirements of S4.3.2.1 may be installed at one or more designated seating positions of a vehicle that otherwise meets the requirements of S4.3.2.2.

S4.3.2.1 First option—complete passenger protection system. The vehicle shall meet the crash protection requirements of S5 by means that require no action by vehicle occupants.

S4.3.2.2 Second option—belt system. [The vehicle shall, at each designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at a front outboard seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at the front outboard seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following:

(a) An automatic locking retractor used at a front outboard seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt portion of a seat belt assembly equipped with an automatic locking retractor that is installed at a front outboard seating position must allow at least ¾ inch, but less than three inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.3.2.2(b) of this standard is determined as follows:

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least ¾ inch but less than three inches. **(55 F.R. 18889—May 7, 1990. Effective: September 1, 1990)]**

S4.4 Buses.

S4.4.1 Buses manufactured on or after January 1, 1972 and before September 1, 1990. Each bus manufactured on or after January 1, 1972 and before September 1, 1990, shall meet the requirements of S4.4.1.1 or S4.4.1.2.

S4.4.1.1 First option—complete passenger protection system—driver only. The vehicle shall meet the crash protection requirements of S5, with respect to an anthropomorphic test dummy in the driver's designated seating position, by means that require no action by vehicle occupants.

S4.4.1.2 Second option—belt system—driver only. The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209.

S4.4.2 Buses manufactured on or after September 1, 1990. Each bus manufactured on or after September 1, 1990, shall meet the requirements of S4.4.2.1 or S4.4.2.2.

S4.4.2.1 First option—complete passenger protection system—driver only. The vehicle shall meet the crash protection requirements of S5, with respect to an anthropomorphic test dummy in the driver's designated seating position, by means that require no action by vehicle occupants.

S4.4.2.2 Second option—belt system—driver only. The vehicle shall, at the driver's designated seating position, have either a Type 1 or a Type 2 seat belt assembly that conforms to § 571.209 of this Part and S7.2 of this Standard. A Type 1 belt assembly or the pelvic portion of a dual retractor Type 2 belt assembly installed at the driver's seating position shall include either an emergency locking retractor or an automatic locking retractor. If a seat belt assembly installed at the driver's seating position includes an automatic locking retractor for the lap belt or the lap belt portion, that seat belt assembly shall comply with the following:

(a) An automatic locking retractor used at a driver's seating position that has some type of suspension system for the seat shall be attached to the seat structure that moves as the suspension system functions.

(b) The lap belt or lap belt porition of a seat belt assembly equipped with an automatic locking retractor that is installed at the driver's seating position must allow at least ¾ inch, but less than three inches, of webbing movement before retracting webbing to the next locking position.

(c) Compliance with S4.4.2.2(b) of this standard is determined as follows:

(1) The seat belt assembly is buckled and the retractor end of the seat belt assembly is anchored to a horizontal surface. The webbing for the lap belt or lap belt portion of the seat belt assembly is extended to 75 percent of its length and the retractor is locked after the initial adjustment.

(2) A load of 20 pounds is applied to the free end of the lap belt or the lap belt portion of the belt assembly (i.e., the end that is not an anchored to the horizontal surface) in the direction away from the retractor. The position of the free end of the belt assembly is recorded.

(3) Within a 30 second period, the 20 pound load is slowly decreased, until the retractor moves to the next locking position. The position of the free end of the belt assembly is recorded again.

(4) The difference between the two positions recorded for the free end of the belt assembly shall be at least ¾ inch but less than three inches.

S4.4.3 Buses manufactured on or after September 1, 1991.

S4.4.3.1 Each bus with a gross vehicle weight rating of more than 10,000 pounds shall comply with the requirements S4.4.2.1 or S4.4.2.2.

S4.4.3.2 [Except as provided in S4.4.3.2.2 and S4.4.3.2.3, each bus with a gross vehicle weight rating of 10,000 pounds or less, except a school bus, shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the front and every rear forward-facing outboard designated seating position, and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)**]

S4.4.3.2.1 As used in this section, a "rear outboard designated position" means any "outboard designated seating position" (as that term is defined at 49 CFR 571.3) that is rearward of the front seats, except any designated seating positions adjacent to a walkway located between the seat and the side of the vehicle, which walkway is designed to allow access to more rearward seating positions.

S4.4.3.2.2 Any rear outboard designated seating position with a seat that can be adjusted to be forward-facing and to face some other direction shall either:

(i) meet the requirements of S4.4.3.2 with the seat in any position in which it can be occupied while the vehicle is in motion; or

(ii) when the seat is in its forward-facing position, have a Type 2 seat belt assembly with an upper torso restraint that conforms to S7.1 and S7.2 of this standard and that adjusts by means of an emergency locking retractor that conforms with Standard No. 209 (49 CFR 571.209), which upper torso restraint may be detachable at the buckle, and, when the seat is in any positon in which it can be occupied while the vehicle is in motion, have a Type 1 seat belt or the pelvic portion of a Type 2 seat belt assembly that conforms to S7.1 and S7.2 of this standard.

S4.4.3.2.3 [Any rear outboard designated seating position on a readily removable seat (that is, a seat designed to be easily removed and replaced by means installed by the manufacturer for that purpose) in a vehicle manufactured on or after

September 1, 1992 shall meet the requirements of S4.4.3.2, and may use an upper torso belt that detaches at either its upper or lower anchorage point, but *not* both anchorage points, to meet those requirements. The means for detaching the upper torso belt shall not use any pushbutton action. **(55 F.R. 30914—July 30, 1990. Effective: January 28, 1991)]**

S4.4.3.3 Each school bus with a gross vehicle weight rating of 10,000 pounds or less shall be equipped with an integral Type 2 seat belt assembly at the driver's designated seating position and at the right front passenger's designated seating position (if any), and with a Type 1 or Type 2 seat belt assembly at all other designated seating positions. Type 2 seat belt assemblies installed in compliance with this requirement shall comply with Standard No. 209 (49 CFR 571.209) and with S7.1 and S7.2 of this standard. The lap belt portion of a Type 2 seat belt assembly installed at the driver's designated seating position and at the right front passenger's designated seating position (if any) shall include either an emergency locking retractor or an automatic locking retractor, which retractor shall not retract webbing to the next locking position until at least ¾ inch of webbing has moved into the retractor. In determining whether an automatic locking retractor complies with the requirement, the webbing is extended to 75 percent of its length and the retractor is locked after the initial adjustment. If a Type 2 seat belt assembly installed in compliance with this requirement incorporates any webbing tension-relieving device, the vehicle owner's manual shall include the information specified in S7.4.2(b) of this standard for the tension-relieving device, and the vehicle shall comply with S7.4.2(c) of this standard.

S4.5 Other general requirements.

S4.5.1 Labeling and driver's manual information. Each vehicle shall have a label setting forth the manufacturer's recommended schedule for the maintenance or replacement, necessary to retain the performance required by this standard, of any crash-deployed occupant protection system. The schedule shall be specified by month and year, or in terms of vehicle mileage, or by intervals measured from the date appearing on the vehicle certification label provided pursuant to 49 CFR Part 567. The label shall be permanently affixed to the vehicle within the passenger compartment and lettered in English in block capitals and numerals not less than three thirty-seconds of an inch high. Instructions concerning maintenance or replacement of the system and a description of the functional operation of the system shall be provided with each vehicle, with an appropriate reference on the label. If a vehicle owner's manual is provided, this information shall be included in the manual.

S4.5.2 Readiness indicator. An occupant protection system that deploys in the event of a crash shall have a monitoring system with a readiness indicator. The indicator shall monitor its own readiness and shall be clearly visible from the driver's designated seating position. A list of the elements of the system being monitored by the indicator shall be included with the information furnished in accordance with S4.5.1 but need not be included on the label.

S4.5.3 Automatic belts. Except as provided in S4.5.3.1, a seat belt assembly that requires no action by vehicle occupants (hereinafter referred to as an "automatic belt") may be used to meet the crash protection requirements of any option under S4 and in place of any seat belt assembly otherwise required by that option.

S4.5.3.1 An automatic belt that provides only pelvic restraint may not be used pursuant to S4.5.3 to meet the requirements of an option that requires a Type 2 seat belt assembly.

S4.5.3.2 An automatic belt, furnished pursuant to S4.5.3, that provides both pelvic and upper torso restraint may have either a detachable or nondetachable upper torso portion, notwithstanding provisions of the option under which it is furnished.

S4.5.3.3 An automatic belt furnished pursuant to S4.5.3 shall:

(a) Conform to S7.1 and have a single emergency release mechanism whose components are readily accessible to a seated occupant.

(b) In place of a warning system that conforms to S7.3 of this standard, be equipped with the following warning system: At the left front designated seating position (driver's position), a warning system that activates a continuous or intermittent audible signal for a period of not less than 4 seconds and not more than 8 seconds and that activates a continuous or flashing warning light visible to the driver for not less than 60 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position) when condition (A) exists simultaneously with condition (B), and that activates a continuous or flashing warning light, visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of Standard No. 101 or, at

the option of the manufacturer if permitted by Standard No. 101, displaying the words "Fasten Seat Belts" or "Fasten Belts", for as long as condition (A) exists simultaneously with condition (C).

(A) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(B) The driver's automatic belt is not in use, as determined by the belt latch mechanism not being fastened or, if the automatic belt is non-detachable, by the emergency release mechanism being in the released position. In the case of motorized automatic belts, the determination of use shall be made once the belt webbing is in its locked protective mode at the anchorage point.

(C) The belt webbing of a motorized automatic belt system is not in its locked, protective mode at the anchorage point.

S4.5.3.4 An automatic belt furnished pursuant to S4.5.3 that is not required to meet the perpendicular frontal crash protection requirements of S5.1 shall conform to the webbing, attachment hardware, and assembly performance requirements of Standard No. 209.

S4.6 Dynamic testing of manual belt systems.

S4.6.1 If the automatic restraint requirement of S4.1.4 is rescinded pursuant to S4.1.5, then each passenger car that is manufactured after September 1, 1989, and is equipped with a Type 2 manual seat belt assembly at each front outboard designated seating position pursuant to S4.1.2.3 shall meet the frontal crash protection requirements of S5.1 at those designated seating positions with a test dummy restrained by a Type 2 seat belt assembly that has been adjusted in accordance with S7.4.2.

A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.6.2 Each truck and multipurpose passenger vehicle with a GVWR of 8,500 pounds or less and an unloaded weight of less than 5,500 pounds that is manufactured on or after September 1, 1991, and is equipped with a Type 2 seat belt assembly at a front outboard designated seating position pursuant to S4.1.2.3 shall meet the frontal crash protection requirements of S5.1 at those designated seating positions with a test dummy restrained by a Type 2 seat belt assembly that has been adjusted in accordance with S7.4.2. A vehicle shall not be deemed to be in noncompliance with this standard if its manufacturer establishes that it did not have reason to know in the exercise of due care that such vehicle is not in conformity with the requirement of this standard.

S4.6.3 A Type 2 seat belt assembly subject to the requirements of S4.6.1 or S4.6.2 of this standard does not have to meet the requirements of S4.2(a)–(c) and S4.4 of Standard No. 209 (49 CFR 571.209) of this Part.

NOTE: *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.)*

S5. Occupant crash protection requirements.

S5.1 [Vehicles subject to S5.1 shall comply with either S5.1(a) or S5.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(a) by means not including any type of seat belt or inflatable restraint shall comply with S5.1(a). **(55 F.R. 39280—September 26, 1990. Effective September 26, 1991.)**]

(a) Impact a vehicle traveling longitudinally forward at any speed, up to and including 30 mph, into a fixed collision barrier that is perpendicular to the line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle under the applicable conditions of S8. The test dummy specified in S8.1.8.1 placed at each front outboard designated seating position shall meet the injury criteria of S6.1.1, S6.1.2, 6.1.3, and 6.1.4.

(b) Impact a vehicle traveling longitudinally forward at any speed, up to and including 30 mph, into a fixed collision barrier that is perpendicular to line of travel of the vehicle, or at any angle up to 30 degrees in either direction from the perpendicular to the line of travel of the vehicle, under the applicable conditions of S8. The test dummy specified in S8.1.8.2 placed at each front outboard designated seating position shall meet the injury criteria of S6.2.1, 6.2.2, 6.2.3, 6.2.4, and 6.2.5.

S5.2 Lateral moving barrier crash.

S5.2.1 [Vehicles subject to S5.2 shall comply with either S5.2.1(a) or S5.2.1(b), or any combination thereof, at the manufacturer's option; except that vehicles manufactured before September 1, 1993 that comply with the requirements of S4.1.2.1(c) by means not including any type of seat belt or inflatable restraint shall comply with S5.2.1(a). **(55 F.R. 39280—September 26, 1990. Effective: September 26, 1991)**]

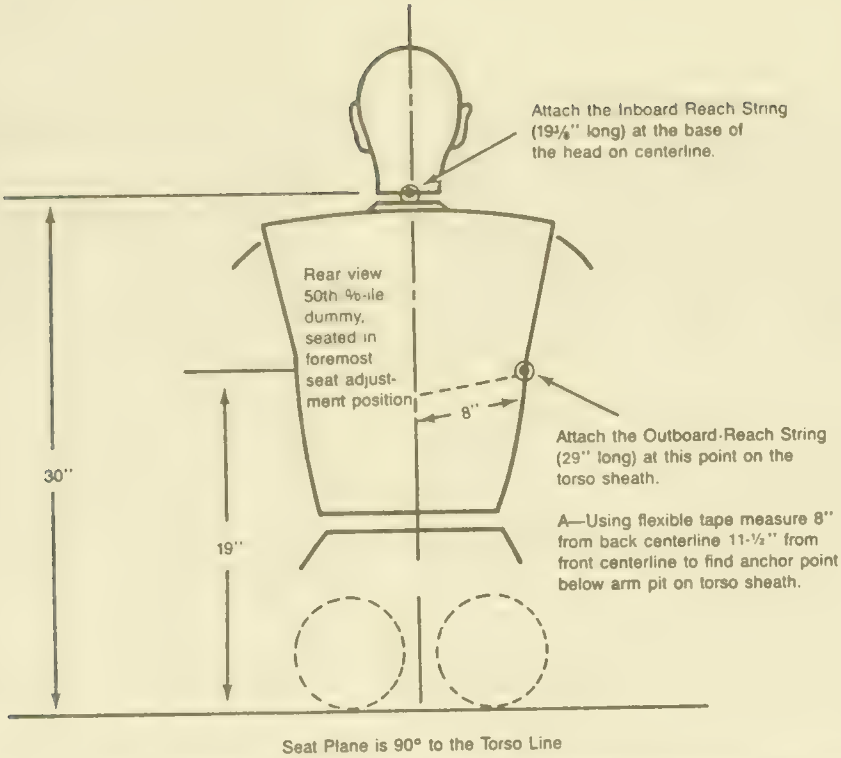


Figure 3a. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility [Using Subpart B Test Device

(52 F.R. 44898—November 13, 1987. Effective: May 23, 1988. *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991)*]

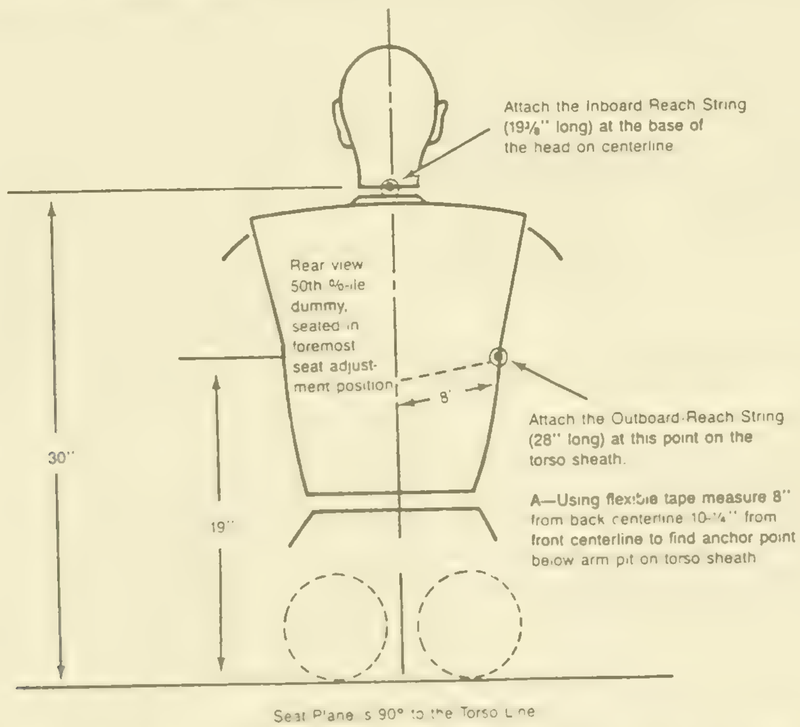


Figure 3b. Location of Anchoring Points for Latchplate Reach Limiting Chains or Strings to Test for Latchplate Accessibility Using Subpart E Test Device

(Added (11/23/87)

S5.3 Rollover. Subject a vehicle to a rollover test under the applicable condition of S8 in either lateral direction at 30 mph with either, at the manufacture's option, a test dummy specified in S8.1.8.1 or S8.1.8.2, placed in the front outboard designated seating position on the vehicle's lower side as mounted on the test platform The test dummy shall meet the injury criteria of either S6.1.1 or S6.2.1.

S6 Injury criteria.

S6.1 Injury criteria for the Part 572, Subpart B, 50th percentile Male Dummy.

S6.1.1 All portions of the test dummy shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.

S6.1.2 The resultant acceleration at the center of gravity of the head shall be such that the expression:

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000 where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two points in time during the crash of the vehicle which are separated by not more than a 36 millisecond time interval.

S6.1.3 The resultant acceleration at the center of gravity of the upper thorax shall not exceed 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.1.4 The compressive force transmitted axially through each upper leg shall not exceed 2,250 pounds.

S6.2 Injury Criteria for the Part 572, Subpart E, hybrid III Dummy.

S6.2.1 All portions of the test dummy shall be contained within the outer surfaces of the vehicle passenger compartment throughout the test.

6.2.2 The resultant acceleration at the center of gravity of the head shall be such that the expression:

$$\left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5} t_2 - t_1$$

shall not exceed 1,000, where a is the resultant acceleration expressed as a multiple of g (the acceleration of gravity), and t_1 and t_2 are any two points in time during the crash of the vehicle which are separated by not more than a 36 millisecond time interval.

S6.2.3 The resultant acceleration calculated from the output of the thoracic instrumentation shown in drawing 78051–218, revision R incorporated by reference in Part 572, Subpart E of this Chapter shall not exceed 60 g's, except for intervals whose cumulative duration is not more than 3 milliseconds.

S6.2.4 Compression deflection of the sternum relative to the spine, as determined by instrumentation shown in drawing 78051–317, revision A incorporated by reference in Part 572, Subpart E of this Chapter, shall not exceed 3 inches. **(53 F.R. 8755—March 17, 1988. Effective: March 17, 1988)**

S6.2.5 The force transmitted axially through each upper leg shall not exceed 2,250 pounds.

S7. Seat belt assembly requirements.

S7.1 Adjustment.

S7.1.1 Except as specified in S7.1.1.1 and S7.1.1.2, the lap belt of any seat belt assembly furnished in accordance with S4.1.2 shall adjust by means of an emergency-locking or automatic-locking retractor that conforms to § 571.209 to fit persons whose dimensions range from those of a

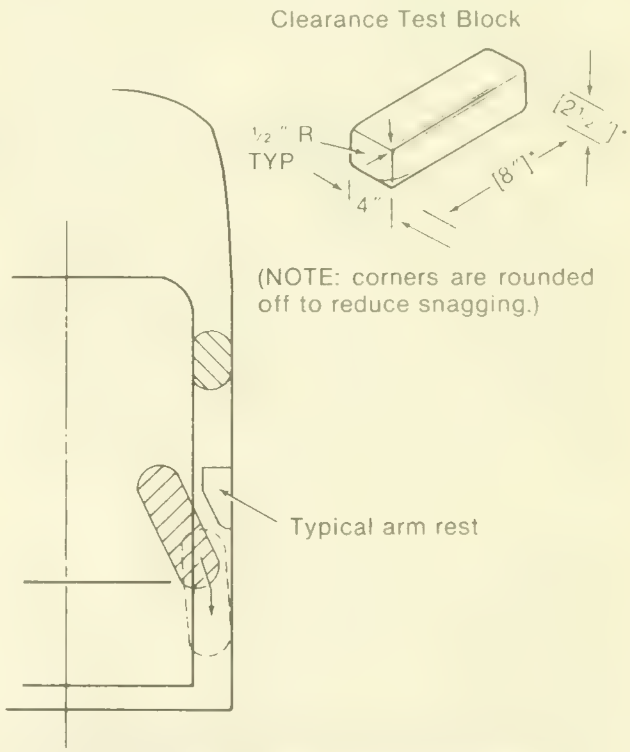


Figure 4. Use of Clearance Test Block to Determine Hand/Arm Access

50th-percentile 6-year-old child to those of a 95th-percentile adult male and the upper torso restraint shall adjust by means of an emergency-locking retractor or a manual adjusting device that conforms to § 571.209 to fit persons whose dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male, with the seat in any position, the seat back in the manufacturer's nominal design riding position, and any adjustable anchorages adjusted to the manufacturer's norminal design position for a 50th percentile adult male occupant. However, an upper torso restraint furnished in accordance with S4.1.2.3.1(a) shall adjust by means of an emergency-locking retractor that conforms to § 571.209. *The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provisions for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1, 1990.*

S7.1.1.1 A seat belt assembly installed at the driver's seating position shall adjust to fit persons whose dimensions range from those of a 5th-percentile adult female to those of a 95th-percentile adult male.

S7.1.1.2. (a) A seat belt assembly installed in a motor vehicle other than a forward control vehicle at any designated seating position other than the outboard positions of the front and second seats shall adjust either by a retractor as specified in S7.1.1 or by a manual adjusting device that conforms to Standard No. 209.

(b) A seat belt assembly installed in a forward control vehicle at any designated seating position other than the front outboard seating positions shall adjust either by a retractor as specified in S7.1.1 or by a manual adjusting device that conforms to Standard No. 209.

S7.1.1.3 [A Type 1 lap belt or the lap belt portion of any Type 2 seat belt assembly installed at any forward-facing outboard designated seating position of a vehicle with a gross vehicle weight rating of 10,000 pounds or less to comply with a requirement of this standard, except walk-in van-type vehicles and school buses, shall meet the requirements of S7.1 by means of an emergency locking retractor that conforms to Standard No. 209 (49 CFR 571.209). **(55 F.R. 30914—July 30, 1990. Effective September 1, 1991)**]

(b) The requirements of S7.1.1.3(a) do not apply to the lap belt portion of any Type 2 belt installed in a passenger car manufactured before September 1, 1989, or to walk-in van-type vehicles.

S7.1.1.4 Notwithstanding the other provisions of S7.1–S7.1.1.3, emergency-locking retractors on belt assemblies located in positions other than front outboard designated seating positions may be equipped with a manual webbing adjustment device capable of causing the retractor that adjusts the lap belt to lock when the belt is buckled.

S7.1.1.5 Removed and Reserved.
(55 F.R. 30914—July 30, 1990.)

S7.1.2 The intersection of the upper torso belt with the lap belt in any Type 2 seat belt assembly furnished in accordance with S4.1.1 or S4.1.2, with the upper torso manual adjusting device, if provided, adjusted in accordance with the manufacturer's instructions, shall be at least 6 inches from the front vertical centerline of a 50th-percentile adult male occupant, measured along the centerline of the lap belt, with the seat in its rearmost and lowest adjustable position and with the seat back in the manufacturer's nominal design riding position.

S7.1.3 The weights and dimensions of the vehicle occupants specified in this standard are as follows:

	50th-percentile 6-year-old child	5th-percentile adult female	50th-percentile adult male	95th-percentile adult male
Weight	47.3 pounds	102 pounds	164 pounds ±3	215 pounds
Erect sitting height	25.4 inches	30.9 inches	35.7 inches ±.1	38 inches
Hip breadth (sitting)	8.4 inches	12.8 inches	14.7 inches ±.7	16.5 inches
Hip circumference (sitting)	23.9 inches	36.4 inches	42 inches	47.2 inches
Waist circumference (sitting)	20.8 inches	23.6 inches	32 inches ±.6	42.5 inches
Chest depth		7.5 inches	9.3 inches ±.2	10.5 inches
Chest circumference:				
(nipple)		30.5 inches		
(upper)		29.8 inches	37.4 inches ±.6	44.5 inches
(lower)		26.6 inches		

S7.2 Latch mechanism. A seat belt assembly installed in any vehicle, except an automatic belt assembly, shall have a latch mechanism:

(a) Whose components are accessible to a seated occupant in both the stowed and operational positions;

(b) That releases both the upper torso restraint and the lap belt simultaneously, if the assembly has a lap belt and an upper torso restraint that require unlatching for release of the occupant; and

(c) That releases at a single point by a pushbutton action.

S7.3 A seat belt assembly provided at the driver's seating position shall be equipped with a warning system that activates, for a period of not less than 4 seconds and not more than 8 seconds (beginning when the vehicle ignition switch is moved to the "on" or the "start" position), a continuous or flashing warning light, visible to the driver, displaying the identifying symbol for the seat belt telltale shown in Table 2 of Federal Motor Vehicle Safety Standard No. 101, or, at the option of the manufacturer if permitted by Federal Motor Vehicle Safety Standard 101, displaying the words "Fasten Seat Belts" or "Fasten Belts" when condition (a) exists, and a continuous or intermittent audible signal when condition (a) exists simultaneously with condition (b).

(a) The vehicle's ignition switch is moved to the "on" position or to the "start" position.

(b) The driver's lap belt is not in use, as determined at the option of the manufacturers, either by the belt latch mechanism not being fastened, or by the belt not being extended at least 4 inches from its stowed position.

S7.3.1 Deleted

S7.3.2 Deleted

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S7.3.4 Deleted

S7.3.5 Deleted

S7.3.5.1 Deleted

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S7.3.5.3 Deleted

S7.3.5.4 Deleted

S7.3a Deleted

S7.4 Seat belt comfort and convenience.

(a) *Automatic seat belts.* Automatic seat belts installed in any vehicle, other than walk-in van-type vehicles, which has a gross vehicle weight rating of 10,000 pounds or less, and which is manufactured on or after September 1, 1986, shall meet the requirements of S7.4.1, S7.4.2, and S7.4.3.

(b) *Manual seat belts.*

(1) *Vehicles manufactured after September 1, 1986.* Manual seat belts installed in any vehicle, other than manual Type 2 belt systems installed in the front outboard seating positions in passenger cars or manual belts in walk-in van-type vehicles, which have a gross vehicle weight rating of 10,000 pounds or less, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

(2) *Vehicles manufactured after September 1, 1989.*

(i) If the automatic restraint requirement of S4.1.4 is rescinded pursuant to S4.1.5, than manual seat belts installed in a passenger car shall meet the requirements of S7.1.1.3(a), S7.4.2, S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

(ii) Manual seat belts installed in a bus, multipurpose passenger vehicle and truck with a gross vehicle weight rating of 10,000 pounds or less, except for walk-in van-type vehicles, shall meet the requirements of S7.4.3, S7.4.4, S7.4.5, and S7.4.6.

S7.4.1 Convenience hooks. Any manual convenience hook or other device that is provided to stow seat belt webbing to facilitate entering or exiting the vehicle shall automatically release the webbing when the automatic belt system is otherwise operational and shall remain in the released mode for as long as (a) exists simultaneously with (b), or, at the manufacturer's option, for as long as (a) exists simultaneously with (c)—

(a) The vehicle ignition switch is moved to the "on" or "start" position;

(b) The vehicle's drive train is engaged;

(c) The vehicle's parking brake is in the released mode (nonengaged).

S7.4.2 Webbing tension-relieving device. [Each vehicle with an automatic seat belt assembly or with a Type 2 manual seat belt assembly that must

meet the occupant crash protection requirements of S5.1 of this standard installed at a front outboard designated seating position, and each vehicle with a Type 2 manual seat belt assembly installed at a rear outboard designated seating position in compliance with a requirement of this standard, the has either automatic or manual tension-relieving devices permitting the introduction of slack in the webbing of the shoulder belt (e.g., "comfort clips" or "window-shade" devices), shall: **54 F.R. 46257—November 2, 1989. Effective: May 1, 1990.)]**

(a) comply with the requirements of S5.1 with the shoulder belt webbing adjusted to introduce the maximum amount of slack recommended by the vehicle manufacturer pursuant to S7.4.2(b);

(b) have a section in the vehicle owner's manual that explains how the tension-relieving device works and specifies the maximum amount of slack (in inches) recommended by the vehicle manufacturer to be introduced into the shoulder belt under normal use conditions. The explanation shall also warn that introducing slack beyond the amount specified by the manufacturer could significantly reduce the effectiveness of the shoulder belt in a crash; and

(c) [have, except for open-body vehicles with no doors, an automatic means to cancel any shoulder belt slack introduced into the belt system by a tension-relieving device. In the case of an automatic safety belt system, cancellation of the tension relieving device shall occur each time the adjacent vehicle door is opened. In the case of a manual seat belt required to meet S5.1, cancellation of the tension-relieving device shall occur, at the manufacturer's option, either each time the adjacent door is opened or each time the latchplate is released from the buckle. In the case of Type 2 manual seat belt assembly installed at a rear outboard designated seating position, cancellation of the tension-relieving device shall occur, at the manufacturer's option either each time the door designed to allow the occupant of that seating position entry and egress of the vehicle is opened or each time the latchplate is released from the buckle. In the case of open-body vehicles with no doors, cancellation of the tension-relieving device may be done by a manul means. **(54 F.R. 46257—November 2, 1989. Effective: May 1, 1990)]**

S7.4.3 Belt contact force. Except for manual or automatic seat belt assemblies that incorporate a webbing tension-relieving device, the upper torso webbing of any seat belt assembly, shall not exert more than 0.7 pounds of contact force when measured normal to and one inch from the chest of an anthropomorphic test dummy, positioned in accordance with S10 or S11 of this standard in the seating position for which that seat belt assembly is provided, at the point where the centerline of the torso belt crosses the midsagittal line on the dummy's chest.

S7.4.4 Latchplate access. Any seat belt assembly latchplate that is located outboard of a front outboard seating position in accordance with S4.1.2, shall also be located within the outboard reach envelope of either the outboard arm or the inboard arm decribed in S10.6 of this standard and, in the case of a Part 572 Subpart B test dummy, Figure 3A of this standard, or, in the case of a Part 572 Subpart E test dummy, Figure 3B of this standard, when the latchplate is in its normal stowed position and any adjustable anchorages are adjusted to the manufacturer's nominal design position for a 50th percentile male occupant. There shall be sufficient clearance between the vehicle seat and the side of the vehicle interior to allow the test block defined in Figure 4 unhindered transit to the latchplate or buckle. *The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provisions for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1, 1990.*)

NOTE: *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991)*

7S.4.5 Retraction. When tested under the conditions of S8.1.2 and S8.1.3, with anthropomorphic test dummies whose arms have been removed and which are positoned in accordance with either S10 or S11, or any combination thereof, in the front outboard designated seating positions and restrained by the belt systems for those positions, the torso and lap belt webbing of any of those seat belt systems shall automatically retract to a stowed position either when the adjacent vehicle door is in the open position and the seat belt latchplate is released, or, at the option of the manufacturer, when the latchplate is released.

S7.4.6 Seat belt guides and hardware.

S7.4.6.1 (a) Any manual seat belt assembly whose webbing is designed to pass through the

seat cushion or between the seat cushion and seat back shall be designed to maintain one of the following three seat belt parts (the seat belt latchplate, the buckle, or the seat belt webbing) on top of or above the seat cushion under normal conditions (i.e., conditions other than when belt hardware is intentionally pushed behind the seat by a vehicle occupant). In addition, the remaining two seat belt parts must be accessible under normal conditions.

(b) The requirements of S7.4.6.1(a) do not apply to: (1) seats whose seat cushions are movable so that the seat back serves a function other than seating, (2) seats which are removable, or (3) seats which are movable so that the space formerly occupied by the seat can be used for a secondary function.

S7.4.6.2 The buckle and latchplate of a manual seat belt assembly subject to S7.4.6.1 shall not pass through the guides or conduits provided for in S7.4.6.1 and fall behind the seat when the events listed below occur in the order specified: (a) the belt is completely retracted or, if the belt is nonretractable, the belt is unlatched; (b) the seat is moved to any position to which it is designed to be adjusted; and (c) the seat back, if foldable, is folded forward as far as possible and then moved backward into position. The inboard receptacle end of a seat belt assembly installed at a front outboard designated seating position shall be accessible with the center arm rest in any position to which it can be adjusted (without having to move the armrest).

S8. Test conditions.

S8.1 General conditions. The following conditions apply to the frontal, lateral, and rollover tests.

S8.1.1 Except as provided in paragraph (c) of this section, the vehicle, including test devices and instrumentation, is loaded as follows:

(a) *Passenger cars.* A passenger car is loaded to its unloaded vehicle weight plus its rated cargo and luggage capacity weight, secured in the luggage area, plus the weight of the necessary anthropomorphic test devices.

(b) *Multipurpose passenger vehicles, trucks, and buses.* A multipurpose passenger vehicle, truck, or bus is loaded to its unloaded vehicle weight plus 300 pounds or its rated cargo and luggage capacity weight, whichever is less, secured in the load carrying area and distributed as nearly as possible in proportion to its gross axle weight ratings, plus the weight of the necessary anthropomorphic test devices.

(c) *Fuel system capacity.* With the test vehicle on a level surface, pump the fuel from the vehicle's fuel tank and then operate the engine until it stops. Then, add Stoddard solvent to the test vehicle's fuel tank in an amount which is equal to not less than 92 and not more than 94 percent of the fuel tank's usable capacity stated by the vehicle's manufacturer. In addition, add the amount of Stoddard solvent needed to fill the entire fuel system from the fuel tank through the engine's induction system.

(d) *Vehicle test attitude.* Determine the distance between a level surface and a standard reference point on the test vehicle's body, directly above each wheel opening, when the vehicle is in its "as delivered" condition. The "as delivered" condition is the vehicle as received at the test site, with 100 percent of all fluid capacities and all tires inflated to the manufacturer's specifications as listed on the vehicle's tire placard. Determine the distance between the same level surface and the same standard reference points in the vehicle's "fully loaded condition." The "fully loaded condition" is the test vehicle loaded in accordance with S8.1.1.(a) or (b), as applicable. The load placed in the cargo area shall be centered over the longitudinal centerline of the vehicle. The pretest vehicle attitude shall be equal to either the "as delivered" or "fully loaded" attitude or between the "as delivered" attitude and the "fully loaded" attitude.

S8.1.2 Adjustable seats are in the adjustment position midway between the forwardmost and rearmost positions, and if separately adjustable in a vertical direction, are at the lowest position. If an adjustment position does not exist midway between the forwardmost and rearmost positions, the closest adjustment position to the rear of the midpoint is used.

S8.1.3 [Place adjustable seat backs in the manufacturer's nominal design riding position in the manner specified by the manufacturer. Place any adjustable anchorages at the manufacturer's nominal design position for a 50th percentile adult male occupant. Place each adjustable head restraint in its highest adjustment position. Adjustable lumbar supports are positioned so that the lumbar support is in its lowest adjustment position. **(54 F.R. 29045—July 11, 1989. Effective: September 1, 1989.** *The provisions for vehicles with adjustable anchorages will apply to vehicles manufactured on or after September 1, 1989, and the provisions for vehicles with tension-relieving devices at seating positions also equipped with air bags will apply to vehicles manufactured on or after September 1, 1990.*)]

S8.1.4 Adjustable steering controls are adjusted so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.

S8.1.5 Movable vehicle windows and vents are at the manufacturer's option, placed in the fully closed position.

S8.1.6 Convertibles and open-body type vehicles have the top, if any, in place in the closed passenger compartment configuration.

S8.1.7 Doors are fully closed and latched but not locked.

S8.1.8 Anthropomorphic test dummies

S8.1.8.1 The anthropomorphic test dummies used for evaluation of occupant protection systems manufactured pursuant to applicable portions of paragraphs S4.1.2, S4.1.3, and S4.1.4 shall conform to the requirements of Subpart B of Part 572 of this Chapter.

S8.1.8.2 Anthropomorphic test devices used for the evaluation of occupant protection systems manufactured pursuant to applicable portions of paragraphs S4.1.2, S4.1.3, and S4.1.4 shall conform to the requirements of Subpart E of Part 572 of this Chapter.

S8.1.9.1 Each Part 572, Subpart B test dummy specified in S8.1.8.1 is clothed in formfitting cotton stretch garments with short sleeves and midcalf length pants. Each foot of the test dummy is equipped with a size 11EE shoe which meets the configuration size, sole, and heel thickness specifications of MIL S–131192 and weighs 1.25 ± 0.2 pounds.

S8.1.9.2 Each Part 572, Subpart E test dummy specified in S8.1.8.2 is clothed in formfitting cotton stretch garments with short sleeves and midcalf length pants specified in drawings 78051–292 and –293 incorporated by reference in Part 572, Subpart E of this Chapter, respectively or their equivalents. A size 11EE shoe specified in drawings 78051–294 (left) and 78051–295 (right) or their equivalents is placed on each foot of the test dummy.

S8.1.10 Limb joints are set at 1g, barely restraining the weight of the limb when extended horizontally. Leg joints are adjusted with the torso in the supine position.

S8.1.11 Instrumentation does not affect the motion of dummies during impact or rollover.

S8.1.12 Temperature of the test dummy.

S8.1.12.1 [The stabilized temperature of the test dummy specified by S8.1.8.1 is at any level between 66 degrees F and 78 degrees F.

S8.1.12.2 The stabilized temperature of the test dummy specified by S8.1.8.2 is at any level between 69 degrees F and 72 degrees F. **(51 F.R. 26688—July 25, 1986. Effective: October 23,1986]**

S8.2 Lateral moving barrier crash test conditions. The following conditions apply to the lateral moving barrier crash test:

S8.2.1 The moving barrier, including the impact surface, supporting structure, and carriage, weighs 4,000 pounds.

S8.2.2 The impact surface of the barrier is a vertical, rigid, flat rectangle, 78 inches wide and 60 inches high, perpendicular to its direction of movement, with its lower edge horizontal and 5 inches above the ground surface.

S8.2.3 During the entire impact sequence the barrier undergoes no significant amount of dynamic or static deformation, and absorbs no significant portion of the energy resulting from the impact, except for energy that results in translational rebound movement of the barrier.

S8.2.4 During the entire impact sequence the barrier is guided so that it travels in a straight line, with no significant lateral, vertical or rotational movement.

S8.2.5 The concrete surface upon which the vehicle is tested is level, rigid and of uniform construction, with a skid number of 75 when measured in accordance with American Society for Testing and Materials Method E–274–65T at 40 mph, omitting water delivery as specified in paragraph 7.1 of that method.

S8.2.6 The tested vehicle's brakes are disengaged and the transmission is in neutral.

S8.2.7 The barrier and the test vehicle are positioned so that at impact—

(a) The vehicle is at rest in its normal attitude;

(b) The barrier is traveling in a direction perpendicular to the longitudinal axis of the vehicle at 20 mph; and

(c) A vertical plane through the geometric center of the barrier impact surface and perpendicular to that surface passes through the driver's seating reference point in the tested vehicle.

S8.3 Rollover test condition. The following conditions apply to the rollover test:

S8.3.1 The tested vehicle's brakes are disengaged and the transmission is in neutral.

S8.3.2 The concrete surface on which the test is conducted is level, rigid, of uniform construction, and of a sufficient size that the vehicle remains on it throughout the entire rollover cycle. It has a skid number of 75 when measured in accordance with American Society for Testing and Materials Method E-274-65T at 40 mph omitting water delivery as specified in paragraph 7.1 of that method.

S8.3.3 The vehicle is placed on a device, similar to that illustrated in Figure 1, having a platform in the form of a flat, rigid plane at an angle of 23° from the horizontal. At the lower edge of the platform is an unyielding flange, perpendicular to the platform with a height of 4 inches and a length sufficient to hold in place the tires that rest against it. The intersection of the inner face of the flange with the upper face of the platform is 9 inches above the rollover surface. No other restraints are used to hold the vehicle in position during the deceleration of the platform and the departure of the vehicle.

S8.3.4 With the vehicle on the test platform, the test devices remain as nearly as possible in the posture specified in S8.1.

S8.3.5 Before the deceleration pulse, the platform is moving horizontally, and perpendicularly to the longitudinal axis of the vehicle, at a constant speed of 30 mph for a sufficient period of time for the vehicle to become motionless relative to the platform.

S8.3.6 The platform is decelerated from 30 to 0 mph in a distance of not more than 3 feet, without change of direction and without transverse or rotational movement during the deceleration of the platform and the departure of the vehicle. The deceleration rate is at least 20g for a minimum of 0.04 seconds.

S9. Pressure vessels and explosive devices.

S9.1 Pressure vessels. A pressure vessel that is continuously pressurized shall conform to the requirements of 49 CFR S178.65-2, -6(b), -7, -9(a) and (b), and -10. It shall not leak or evidence visible distortion when tested in accordance with § 178.65-11(a) and shall not fail in any of the ways enumerated in § 178.65-11(b) when hydrostatically tested to destruction. It shall not crack when flattened in accordance with § 178.65-12(a) to the limit specified in § 178.65-12(a) (4).

S9.2 Explosive devices. An explosive device shall not exhibit any of the characteristics prohibited by 49 CFR S173.51. All explosive material shall be enclosed in a structure that is capable of containing the explosive energy without sudden release of pressure except through overpressure relief devices or parts designed to release the pressure during actuation.

S10. Test dummy positioning procedures. [Position a test dummy, conforming to Subpart B of Part 572 of this chapter, in each front outboard seating position of a vehicle as set forth below in S10 through S10.9. Each test dummy is restrained during the crash tests of S5 as follows: **[(54 F.R. 23986—June 5, 1989. Effective: December 4, 1989)]**

(a) In a vehicle equipped with automatic restraints at each front outboard designated seating position that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(1), each test dummy is not restrained during the frontal test of S5.1, the lateral test of S5.2 and the rollover test of S5.3 by any means that require occupant action.

(b)(1) In a vehicle equipped with an automatic restraint at each front outboard seating position that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(2), each test dummy is not restrained during one frontal test of S5.1 by any means that require occupant action. If the vehicle has a manual seat belt provided by the manufacturer to comply with the requirements of S4.1.2.1(c), then a second frontal test is conducted in accordance with S5.1 and each test dummy is restrained both by the authomatic restraint system and the manual seat belt, adjusted in accordance with S10.9.

(2) In a vehicle equipped with an automatic restraint only at the driver's designated seating position, pursuant to S4.1.3.4(a)(2), that is certified by its manufacturer as meeting the requirements of S4.1.2.1(a) and (c)(2), the driver test dummy is not restrained during one frontal test of S5.1 by any means that require occupant action. If the vehicle also has a manual seat belt provided by the

manufacturer to comply with the requirements of S4.1.2.1(c), then a second frontal test is conducted in accordance with S5.1 and the driver test dummy is restrained both by the automatic restraint system and the manual seat belt, adjusted in accordance with S10.9. At the option of the manufacturer, a passenger test dummy can be placed in the right front outboard designated seating postion during the testing required by this section. If a passenger test dummy is present, it shall be restrained by a manual seat belt, adjusted in accordance with S10.9

(c) In a vehicle equipped with a manual safety belt at the front outboard designated seating positions that is certified by its manufacturer to meet the requirements of S4.6, each test dummy is restrained by the manual safety belts, adjusted in accordance with S10.9, installed at each front outboard seating position.

S10.1 Vehicle equipped with front bucket seats. Place the test dummy's torso against the seat back and its upper legs against the seat cushion to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10. Center the test dummy on the seat cushion of the bucket seat and set its midsagittal plane so that it is vertical and parallel to the centerline of the seat cushion.

S10.1.1 Driver position placement.

(a) Initially set the knees of the test dummy 11¾ inches apart, measured between the outer surfaces of the knee pivot bolt heads, with the left outer surface 5.9 inches from the midsagittal plane of the test dummy.

(b) Rest the right foot of the test dummy on the undepressed accelerator pedal with the rearmost point of the heel on the floor pan in the plane of the pedal. If the foot cannot be placed on the accelerator pedal, set it initially perpendicular to the lower leg and place it as far forward as possible in the direction of the pedal centerline with the rearmost point of the heel resting on the floor pan. Except as prevented by contact with a vehicle surface, place the right leg so that the upper and lower leg centerlines fall, as close as possible, in a vertical longitudinal plane without inducing torso movement.

(c) [Place the left foot on the toeboard with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toeboard and the floor pan and not on the wheelwell projection. If the foot cannot be positioned on the toeboard, set it initially perpendicular to the lower leg and place it as far forward as possible with the heel resting on the floor pan. If necessary to avoid contact with the vehicle's brake or clutch pedal, rotate the test dummy's left foot about the lower leg. If there is still pedal interference, rotate the left leg outboard about the hip the minimum distance necessary to avoid the pedal interference. Except as prevented by contact with a vehicle surface, place the left leg so that the upper and lower leg centerlines fall, as close as possible, in a vertical plane. For vehicles with a foot rest that does not elevate the left foot above the level of the right foot, place the left foot on the foot rest so that the upper and lower leg centerlines fall in a vertical plane. **(51 F.R. 31765—September 5, 1986. Effective: September 5, 1986)]**

S10.1.2 Passenger position placement.

S10.1.2.1 Vehicle with a flat floor pan/toeboard.

(a) Initially set the knees 11¾ inches apart, measured between the outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet on the vehicle's toeboard with the heels resting on the floor pan as close as possible to the intersection point with the toeboard. If the feet cannot be placed flat on the toeboard, set them perpendicular to the lower leg centerlines and place them as far forward as possible with the heels resting on the floor pan.

(c) Place the right and left legs so that the upper and lower leg centerlines fall in vertical longitudinal planes.

S10.1.2.2 Vehicles with wheelhouse projections in passenger compartment.

(a) Initially set the knees 11¾ inches apart, measured between outer surfaces of the knee pivot bolt heads.

(b) Place the right and left feet in the well of the floor pan/toeboard and not on the wheelhouse projection. If the feet cannot be placed flat on the toeboard, initially set them perpendicular to the lower leg centerlines and then place them as far forward as possible with the heels resting on the floor pan.

(c) If it is not possible to maintain vertical and longitudinal planes through the upper and lower

leg centerlines for each leg, then place the left leg so that its upper and lower centerlines fall, as closely as possible, in a vertical longitudinal plane and place the right leg so that its upper and lower leg centerlines fall, as closely as possible, in a vertical plane.

S10.2 Vehicle equipped with bench seating. Place a test dummy with its torso against the seat back and its upper legs against the seat cushion, to the extent permitted by placement of the test dummy's feet in accordance with the appropriate paragraph of S10.1.

S10.2.1 Driver position placement. Place the test dummy at the left front outboard designated seating position so that its midsagittal plane is vertical and parallel to the centerline of the vehicle and so that the midsagittal plane of the test dummy passes through the center of the steering wheel rim. Place the legs, knees, and feet of the test dummy as specified in S10.1.1.

S10.2.2 Passenger position placement. [Place the test dummy at the right front outboard designated seating position so that the midsagittal plane of the test dummy is vertical and longitudinal, and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the test dummy at the driver's position. Place the legs, knees, and feet of the test dummy as specified in S10.1.2. **(51 F.R. 31765—September 5, 1986. Effective: September 5, 1986)**]

S10.3 Initial test dummy head and arm placement. With the test dummy at its designated seating position as specified by the appropriate requirements of S10.1 or S10.2, place the upper arms against the seat back and tangent to the side of the upper torso. Place the lower arms and palms against the outside of the upper legs.

S10.4 Test dummy settling.

S10.4.1 Test dummy vertical upward displacement. Slowly lift the test dummy parallel to the seat back plane until the test dummy's buttocks no longer contact the seat cushion or until there is test dummy head contact with the vehicle's headlining.

S10.4.2 Lower torso force application. Apply a rearward force of 50 pounds against the center of the test dummy's lower torso in a horizontal direction. The line of force application shall be 6.5 inches above the bottom surface of the test dummy's buttocks.

S10.4.3 Test dummy vertical downward displacement. Remove as much of the 50-pound force as necessary to allow the test dummy to return downward to the seat cushion by its own weight.

S10.4.4 Test dummy upper torso rocking. Apply a 10-to- 15-pound horizontal rearward force to the test dummy's lower torso. Then apply a horizontal forward force to the test dummy's shoulders sufficient to flex the upper torso forward until its back no longer contacts the seat back. Rock the test dummy from side to side 3 or 4 times so that the test dummy's spine is at any angle from the vertical in the 14-to-16-degree range at the extremes of each rocking movement.

S10.4.5 Test dummy upper torso force application. While maintaining the 10-to-15-pound horizontal rearward force applied in S10.4.4 and with the test dummy's midsagittal plane vertical, push the upper torso back against the seat back with a force of 50 pounds applied in a horizontal rearward direction along a line that is coincident with the test dummy's midsagittal plane and 18 inches above the bottom surface of the test dummy's buttocks.

S10.5 Belt adjustment for dynamic testing. With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3, and S10.1 through S10.4, place and adjust the safety belt as specified below.

S10.5.1 Manual safety belts. Place the Type 1 or Type 2 manual belt around the test dummy and fasten the latch. Pull the Type 1 belt webbing out of the retractor and allow it to retract; repeat this operation four times. Remove all slack from the lap belt portion of a Type 2 belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times so that the excess webbing in the shoulder belt is removed by the retractive force of the retractor. Apply a 2 to 4 pound tension load to the lap belt of a single retractor system by pulling the upper torso belt adjacent to the latchplate. In the case of a dual retractor system, apply a 2 to 4 pound tension load by pulling the lap belt adjacent to its retractor. Measure the tension load as close as possible to the same location where the force was applied. After the tension load has been applied, ensure that the upper torso belt lies flat on the test dummy's shoulder.

S10.5.2 Automatic safety belts. Ensure that the upper torso belt lies flat on the test dummy's shoulder after the automatic belt has been placed on the test dummy.

S10.5.3 Belts with tension-relieving devices. If the automatic or dynamically-tested manual safety belt system is equipped with a tension-relieving device, introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle.

S10.6 Placement of test dummy arms and hands. With the test dummy positioned as specified by S10.4 and without inducing torso movement, place the arms, elbows, and hands of the test dummy, as appropriate for each designated seating position in accordance with S10.6.1 or S10.6.2. Following placement of the arms, elbows and hands, remove the force applied against the lower half of the torso.

S10.6.1 Driver's position. Move the upper and the lower arms of the test dummy at the driver's position to their fully outstretched position in the lowest possible orientation. Push each arm rearward permitting bending at the elbow, until the palm of each hand contacts the outer part of the rim of the steering wheel at its horizontal centerline. Place the test dummy's thumbs over the steering wheel rim and position the upper and lower arm centerlines as close as possible in a vertical plane without inducing torso movement. The thumbs shall be over the steering wheel rim and are lightly taped to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 2 pounds and not more than 5 pounds, the tape shall release the hand from the steering wheel rim.

NOTE: *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991)*

S10.6.2 Passenger position. Move the upper and lower arms of the test dummy at the passenger position to the fully outstretched position in the lowest possible orientation. Push each arm rearward, permitting bending at the elbow, until the upper arm contacts the seat back and is tangent to the upper part of the side of the torso, the palm contacts the outside of the thigh, and the little finger is barely in contact witht the seat cushion.

S10.7 Repositioning of feet and legs. After the test dummy has been settled in accordance with S10.4, the safety belt system has been positioned, if necessary, in accordance with S10.5, and the arms and hands of the test dummy have been positioned in accordance with S10.6, reposition the feet and legs of the test dummy, if necessary, so that the feet and legs meet the applicable requirements of S10.1 or S10.2

S10.8 Test dummy positioning for latchplate access. The reach envelopes specified in S7.4.4. are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S10.9 Test dummy positioning for belt contact force.

S10.9.1 Vehicle manufactured before September 1, 1987. To determine compliance with S7.4.3 of this standard, a manufacturer may use, at its option, either the test procedure of S10.9.1 or the test procedure of S10.9.2. Position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Fasten the latch and pull the belt webbing three inches from the test dummy's chest and release until the webbing is within one inch of the test dummy's chest and measure the belt contact force.

S10.9.2 Vehicle manufactured on or after September 1, 1987. To determine compliance with S7.4.3. of this standard, position the test dummy in the vehicle in accordance with the appropriate requirements specified in S10.1 or S10.2 and under the conditions of S8.1.2 and S8.1.3. Close the vehicle's adjacent door, pull either 12 inches of belt webbing or the maximum available amount of belt webbing, whichever is less, from the retractor and then release it, allowing the belt webbing to return to the dummy's chest. Fasten the latch and pull the belt webbing three inches from the test dummy's chest and release until the webbing is within one inch of the test dummy's chest and measure the belt contact force.

S11 Positioning procedure for the Part 572 Subpart E Test Dummy.

Position a test dummy, conforming to Subpart E of Part 572 of this Chapter, in each front outboard seating position of a vehicle as specified in S11.1 through S11.6. Each test dummy is restrained in accordance with the applicable requirements of S4.1.2.1, 4.1.2.2 or S4.6.

S11.1 Head. [The transverse instrumentation platform of the head shall be horizontal within ½ degree. To level the head of the test dummy, the following sequences must be followed. First adjust the position of the H point within the limits set forth in S11.4.3.1 to level the transverse instrumentation platform of the head of the test dummy. If the transverse instrumentation platform of the head is still not level, then adjust the pelvic angle of the test dummy within the limits specified in S11.4.3.2 of the standard. If the transverse instrumentation platform of the head is still not level, then adjust the neck bracket of the test dummy the minimum amount necessary from the non-adjusted "0" setting to ensure that the transverse instrumentation platform of the head is horizontal within ½ degree. The test dummy shall remain within the limits specified in S11.4.3.1 and S11.4.3.2 after any adjustment of the neck bracket.**(54 F.R. 23986—June 5, 1989. Effective: December 4, 1989.)]**

S11.2 Arms.

S11.2.1 The driver's upper arms shall be adjacent to the torso with the centerlines as close to a vertical plane as possible.

S11.2.2 The passenger's upper arms shall be in contact with the seat back and the sides of torso.

S11.3 Hands.

S11.3.1 The palms of the driver test dummy shall be in contact with the outer part of the steering wheel rim at the rim's horizontal centerline. The thumbs shall be over the steering wheel rim and shall be lightly taped to the steering wheel rim so that if the hand of the test dummy is pushed upward by a force of not less than 2 pounds and not more than 5 pounds, the tape shall release the hand from the steering wheel rim.

NOTE: *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991)*

S11.3.2 The palms of the passenger test dummy shall be in contact with outside of thigh. The little finger shall be in contact with the seat cushion.

S11.4 Torso.

S11.4.1 In vehicles equipped with bench seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver dummy shall be vertical and parallel to the vehicle's longitudinal centerline, and pass through the center of the steering wheel rim. The midsagittal plane of the passenger dummy shall be vertical and parallel to the vehicle's longitudinal centerline and the same distance from the vehicle's longitudinal centerline as the midsagittal plane of the driver dummy.

S11.4.2 In vehicles equipped with bucket seats, the upper torso of the driver and passenger test dummies shall rest against the seat back. The midsagittal plane of the driver and the passenger dummy shall be vertical and shall coincide with the longitudinal centerline of the bucket seat.

S11.4.3 Lower torso.

S11.4.3.1 H-point. The H-point of the driver and passenger test dummies shall coincide within ½ inch in the vertical dimension and ½ inch in the horizontal dimension of a point ¼ inch below the position of the H-point determined by using the equipment and procedures specified in SAE J826 (Apr 80) except that the length of the lower leg and thigh segments of the H-point machine shall be adjusted to 16.3 and 15.8 inches, respectively, instead of the 50th percentile values specified in Table 1 of SAE J826.

S11.4.3.2 Pelvic angle. As determined using the pelvic angle gage (GM drawing 78051-532 incorporated by reference in Part 572, Subpart E of this chapter) which is inserted into the H-point gaging hole of the dummy, the angle measured from the horizontal on the 3 inch flat surface of the gage shall be 22½ degrees plus or minus 2½ degrees.

S11.5 Legs. The upper legs of the driver and passenger test dummies shall rest against the seat cushion to the extent permitted by placement of

the feet. The initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches. To the extent practicable, the left leg of the driver dummy and both legs of the passenger dummy shall be in vertical longitudinal planes. Final adjustment to accommodate placement of feet in accordance with S11.6 for various passenger compartment configurations is permitted.

S11.5.1 The legs of the driver and passenger test dummy shall be placed as provided in S11.5.2 or, at the option of the vehicle manufacturer until September 1, 1991, as provided in S10.1.1 for driver and S10.1.2 for the passenger, except that the initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches for both the driver and the passenger rather than 14½ inches as specified in S10.1.1 (a) for the driver and 11¾ inches as specified in S10.1.2.1 (a) and S10.1.2.2 (a) for the passenger.

S11.5.2 The upper legs of the driver and passenger test dummies shall rest against the seat cushion to the extent permitted by placement of the feet. The initial distance between the outboard knee clevis flange surfaces shall be 10.6 inches. To the extent practicable, the left leg of the driver dummy and both legs of the passenger dummy shall be in vertical longitudinal planes. To the extent practicable, the right leg of the driver dummy shall be in a vertical plane. Final adjustment to accommodate placement of feet in accordance with S11.6 for various passenger compartment configurations is permitted.

NOTE: *Multipurpose passenger vehicles and trucks with a gross vehicle weight of 8,500 pounds or les and an unloaded vehicle weight of 5,500 pounds or less must comply with the dynamic testing requirements of S4.6 of Standard No. 208 beginning on September 1, 1991.)*

S11.6 Feet. [The feet of the driver test dummy shall be positioned in accordance with S10.1.1 (b) and (c) of this standard. The feet of the passenger test dummy shall be positioned in accordance with S10.1.2.1 (b) and (c) of this standard, as appropriate. **(54 F.R. 23986—June 5, 1989. Effective: December 4, 1989.]**

S11.7 Test dummy positioning for latchplate access. The reach envelopes specified in S7.4.4 are obtained by positioning a test dummy in the driver's seat or passenger's seat in its forwardmost adjustment position. Attach the lines for the inboard and outboard arms to the test dummy as described in Figure 3 of this standard. Extend each line backward and outboard to generate the compliance arcs of the outboard reach envelope of the test dummy's arms.

S11.8 Test dummy positioning for belt contact force. To determine compliance with S7.4.3 of this standard, position the test dummy in the vehicle in accordance with the requirements specified in S11.1 through S11.6 and under the conditions of S8.1.2 and S8.1.3. Pull the belt webbing three inches from the test dummy's chest and release until the webbing is within 1 inch of the test dummy's chest and measure the belt contact force.

S11.9 Manual belt adjustment for dynamic testing. With the test dummy at its designated seating position as specified by the appropriate requirements of S8.1.2, S8.1.3 and S11.1 through S11.6, place the Type 2 manual belt around the test dummy and fasten the latch. Remove all slack from the lap belt. Pull the upper torso webbing out of the retractor and allow it to retract; repeat this operation four times. Apply a 2 to 4 pound tension load to the lap belt. If the belt system is equipped with a tension-relieving device introduce the maximum amount of slack into the upper torso belt that is recommended by the manufacturer for normal use in the owner's manual for the vehicle. If the belt system is not equipped with a tension-relieving device, allow the excess webbing in the shoulder belt to be retracted by the retractive force of the retractor.

S12 Removed. (54 F.R. 23986—June 5, 1989.

Interpretation

The concept of an occupant protection system which requires "no action by vehicle occupants," as that term is used in Standard No. 208, is intended to designate a system which will perform its protective restraining function after a normal process of ingress or egress without separate deliberate actions by the vehicle occupant to deploy the restraint system. Thus, the agency considers an occupant protection system to be automatic if an occupant has to take no action to deploy the system but would normally slightly push the seat belt webbing aside when entering or exiting the vehicle or would normally make a slight adjustment in the webbing for comfort.

36 F.R. 4600
March 10, 1971

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U.S. Department of Transportation
National Highway Traffic Safety Administration

Federal Motor Vehicle Safety Standards and Regulations

Supplement 44—Amendments and Interpretations Issued During 1991

Page Control Chart

(1) PART 541—Final Listing of High Theft Lines for MY 1991
(a) Insert attached pages numbered PART 541—PRE 67 through PRE 71-72 behind page in book numbered PART 541—PRE 65-66.
(b) Substitute attached pages numbered PART 541—A-1 through A—5-6 for similarly numbered pages in book.

(2) PART 567—Certification.
(a) Insert attached page numbered PART 567-PRE 97 behind page in book numbered PART 567— PRE 95-96.
(b) Substitute attached pages numbered PART 567-1 through 4 for similarly numbered pages in book.

(3) PART 572—Anthropomorphic Test Dummies.
(a) Insert attached pages numbered PART 572—PRE 83 through PRE 102 behind page in book numbered PART 572-PRE 82.
(b) Substitute attached pages numbered PART 572-11 through 19 for similarly numbered pages in book.

(4) PART 574—Tire Identification and Recordkeeping.
(a) Insert attached pages numbered PART 574-PRE 47 through PRE 63-64 behind page in book numbered PART 574—PRE 45-46.
(b) Substitute attached PART 574 for PART 574 in book.

(5) PART 575—Consumer Information Regulations.
(a) Insert attached pages numbered PART 575-PRE 161 through PRE 173-174 behind page in book numbered PART 575-PRE 159-160.
(b) Substitute attached pages numbered PART 575-7 through 15-16 for similarly numbered pages in book.

(6) PART 586—Reporting Compliance With Phasing-in of Dynamic Impact Test Requirements
Insert attached pages numbered PART 586-PRE 1 through PART 586-2 behind page in book numbered PART 585-2.

(7) PART 587—Moving Deformable Barrier
Insert attached pages numbered PART 587-PRE 1 through PART 587-2 behind page in book numbered PART 586-2, mentioned above.

(8) PART 591—Importation of Motor Vehicles and Equipment.
(a) Insert attached pages numbered PART 591—PRE 17 through PRE—41-42 behind page in book numbered PART 591-PRE 15-16.
(b) Substitute attached pages numbered PART 591-1 through 13 for pages in book numbered PART 591-1 through 4.

(9) PART 592—Registered Importers of Vehicles Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards.
(a) Insert attached page numbered PART 592-PRE 17-18 behind page in book numbered PART 592-PRE 16.
(b) Substitute attached pages numbered PART 592—1 through 5 for similarly numbered pages in book.

(10) PART 593- Determinations That a Vehicle Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards is Eligible for Importation
(a) Insert attached page numbered PART 593-PRE 11-12 behind page in book numbered PART 593-PRE 9-10.
(b) Substitute attached pages numbered PART 593-1 through 3-4 for similarly numbered pages in book.

(11) PART 594-Schedule of Fees Authorized by the National Traffic and Motor Vehicle Safety Act.
(a) Insert attached pages numbered PART 594-PRE 13 through 16 behind page in book numbered PART 594-PRE 11-12.
(b) Substitute attached pages numbered PART 594-1 through 4 for similarly numbered pages in book.

The Federal Motor Vehicle Safety Standards and amendments published in this format are for reference purposes only. They should not be considered as legally binding or be used as a source of authority in matters of litigation. *The United States Code of Federal Regulations* is the only source of legal authority for the standards.

PREAMBLE TO AN AMENDMENT TO PART 541

Final Listing of High Theft lines for 1991 Model Year; Motor Vehicle Theft Prevention Standard (Docket 90-19; Notice 01) RIN 2127-AD33

ACTION: Final rule; technical amendment.

SUMMARY: The purpose of this notice is to (1) report the results of this agency's actions for determining which car lines are subject to the marking requirements of the motor vehicle theft prevention standard for the 1991 model year, and (2) publish a list of those car lines. NHTSA has previously published lists of the car lines that were selected as high theft car lines for prior model years, beginning with the 1987 model year. The list in this notice includes all of the car lines in the previous lists, as well as five new lines that were introduced for the 1991 model year and that have been selected as likely high theft lines. In addition, this listing shows the two additional lines that have standard equipment anti-theft devices and have been granted exemptions from the requirements of the theft prevention standard beginning with the 1991 model year. Two more car lines have been exempted in part and are required to have only their engines and transmissions marked.

This final listing for the 1991 model year is intended to inform the public, particularly law enforcement groups, of the car lines that are subject to the marking requirements of the theft prevention standard for the 1991 model year.

EFFECTIVE DATE: This listing applies to the 1991 model year. The amendment made by this notice is effective September 11, 1990.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Theft Prevention Standard. 49 CFR Part 541, sets forth requirements for inscribing or affixing identification numbers onto covered original equipment major parts, and the replacement parts for those original equipment parts, on all vehicles in lines selected as high theft lines.

Section 603(a)(2) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2023(a)(2); hereinafter "the Cost Savings Act") specifies that NHTSA shall select the high theft lines, with the agreement of the manufacturer, if possible. Section 603(d) of the Cost Savings Act (15 U.S.C. 2023(d)) provides that once a line has been designated as a high theft line, it remains subject to the theft prevention standard unless that line is exempted under section 605 of the Cost Savings Act (15 U.S.C. 2025). Section 605 provides that a manufacturer may petition to have a high theft line exempted from the requirements of Part 541, if the line is equipped as standard equipment with an anti-theft device. The exemption is granted if NHTSA determines that the anti-theft device is likely to be as effective as compliance with Part 541 in reducing and deterring motor vehicle thefts.

The agency annually publishes a list of the lines so selected for previous model years. This notice is intended to inform the public, particularly law enforcement groups, of the high-theft car lines for the 1991 model year, and of those car lines that are exempted from the theft prevention standard for the 1991 model year because of standard equipment anti-theft devices

The list includes the five new 1991 car lines selected by the agency in accordance with procedures published in 49 CFR Part 542 as likely to be high theft lines. The list also includes all those lines that were selected as high theft lines and listed for prior model years. For model year 1990, the Alfa Romeo 164 car line was incorrectly identified as the Fiat 164. The Alfa Romeo 164 is correctly identified for the 1991 model year.

This notice also includes four high theft lines exempted by the agency, beginning in MY 1991, from the parts marking requirements of Part 541. Two of these car lines are exempted in full from Part 541 and two are exempted in part.

Notice and comment; effective date. The car lines listed as being subject to the standard have been selected as high theft lines in accordance with the procedures of 49 CFR Part 542 and section 603 of the Cost Savings Act. Under these procedures, manufacturers evaluate new car lines to conclude whether those new lines are likely to have high theft rates. Manufacturers submit these evaluations and conclusions to the agency, which makes an independent evaluation, and, on a preliminary basis, determines whether the new line should be subject to parts marking. NHTSA informs

the manufacturer in writing of its evaluations and determinations, together with the factual information considered by the agency in making them. The manufacturer may request the agency to reconsider these preliminary determinations. Within 60 days of the receipt of the request, NHTSA makes its final determination. NHTSA informs the manufacturer by letter of these determinations and its response to the request for reconsideration. If there is no request for reconsideration, the agency's determination becomes final 45 days after sending the letter with the preliminary determination. Each of the new car lines on the high theft list is the subject of a final determination.

Similarly, the car lines listed as being exempt from the standard have been exempted in accordance with the procedures of 49 CFR Part 543 and section 605 of the Cost Savings Act.

Therefore, NHTSA finds for good cause that notice and opportunity for comment on this listing are unnecessary. Further, public comment on the listing of selections and exemptions is not contemplated by Title VI, and is unnecessary after the selections and exemptions have been made in accordance with the statutory criteria.

For the same reasons, since this revised listing only informs the public of previous agency actions, and does not impose any additional obligations on any party, NHTSA finds for good cause that the amendment made by this notice should be effective as soon as it is published in the *Federal Register*.

In consideration of the foregoing, 49 CFR Part 541 is amended as follows:

Appendix A of Part 541 is revised, Appendix A-I revised to read as follows, and Appendix A-II is revised to read as follows:

PART 541—Appendix A

Lines subject to the requirements of Part 541

Manufacturer	*Subject Lines*
Alfa Romeo	Milano 161 Fiat 164
BMW	3—Carline 5—Carline 6—Carline
Chrysler	Chrysler Executive Sedan/Limousine Chrysler Fifth Avenue/Newport Chrysler Laser Chrysler LeBaron/Town & Country Chrysler LeBaron GTS Chrysler TC Chrysler Eagle Talon Chrysler New Yorker Fifth Avenue Dodge Aries Dodge Daytona Dodge Diplomat Dodge Lancer Dodge 600 【Dodge Stealth*】 Plymouth Caravelle Plymouth Laser Plymouth Gran Fury Plymouth Reliant
【Consulier	Consulier GTP*】
Ferrari	Mondial 8 308 328
Ford	Ford Mustang Ford Thunderbird Ford Probe Mercury Capri Mercury Cougar Lincoln Continental Lincoln Mark Lincoln Town Car Merkur Scorpio Merkur XR4Ti
General Motors	Buick Electra Buick LeSabre Buick Reatta Buick Regal Buick Riviera Cadillac DeVille Cadillac Eldorado Cadillac Seville Chevrolet Nova Chevrolet Lumina
	Oldsmobile Cutlass Supreme Oldsmobile Delta 88 Oldsmobile 98 Oldsmobile Toronado Pontiac Bonneville Pontiac Fiero Pontiac Grand Prix Geo Prizm Geo Storm

PART 541—Appendix A—Continued

Lines subject to the requirements of Part 541

Manufacturer	*Subject Lines*
[Isuzu	90JZ* Impulse] [90JX* Impluse]
Jaguar	XJ XJ-6 XJ-40
Lotus	M100 [Lotus Elan*]
Maserati	Biturbo Quattroporte 228
Mazda	GLC 626 MX-6 MX-5 Miata
Mercedes-Benz	190 D/E 250D-T 260 E 300 CE 300 D/E 300 SE 300 SL 300 TD 300 TE 300 SDL 300 SEL 380 SEC/500 SEC 380 SEL/500 SEL 380 SL 420 SEL 500 SL 560 SEL 560 SEC 560 SL
Mitsubishi	Cordia Tredia Eclipse [3000GT*]
Peugeot	405
Porsche	924S
Reliant	SS1
Saab	900
Subaru	XT
Toyota	Camry Celica Corolla/Corolla Sport MR2 Starlet
Volkswagen	Audi Quattro Volkswagen Cabriolet Volkswagen Rabbit Volkswagen Scirocco Volkswagen Corrado

* Lines added in Model Year 1991.

PART 541—Appendix A-I

High-Theft Lines With Antitheft Devices That are Exempted from the Requirements of This Standard Pursuant to 49 CFR Part 543

Manufacturer	*Exempted Lines*
Austin Rover	Sterling
BMW	7 Car line
Chrysler Chrysler	Chrysler Conquest Imperial
General Motors	Cadillac Allante Chevrolet Corvette
[Honda	Acura NS-X** Acura Legend**]
Isuzu	Impulse
Mazda	929 RX 7
Mitsubishi	Galant Starion
Nissan	Maxima 300 ZX Infiniti M30 Infiniti Q45
Porsche	911 928
Saab	9000
Toyota	Supra Cressida Lexus LS400 Lexus ES250
Volkswagen	Audi 500S Audi 100 Audi 200
Volvo	480ES

* Lines exempted from the requirements of Part 541 pursuant to 49 CFR Part 543 in MY 1991.

PART 541—Appendix A-II

High Theft Lines With Antitheft Devices That are Exempted in Part From the Parts-Marking Requirements of This Standard Pursuant to 49 CFR Part 543

Manufacturer	*Exempted Lines*	*Parts Marked*
General Motors	Chevrolet Camaro	Engine, Transmission
	Pontiac Firebird	Engine, Transmission
	[Cadillac Deville-Fleetwood***	Engine, Transmission
	Oldsmobile 98***	Engine, Transmission]

*** Received partial exemptions from the requirements of PART 541 pursuant to 49 CFR Part 543 in MY 1990.

Jeffrey R. Miller
Acting Administrator

55 F.R. 37326
September 11, 1990

PART 541—Appendix A

Lines subject to the requirements of Part 541

Manufacturer	*Subject Lines*
Alfa Romeo	Milano 161 Fiat 164
BMW	3—Carline 5—Carline 6—Carline
Chrysler	Chrysler Executive Sedan/Limousine Chrysler Fifth Avenue/Newport Chrysler Laser Chrysler LeBaron/Town & Country Chrysler LeBaron GTS Chrysler TC Chrysler Eagle Talon Chrysler New Yorker Fifth Avenue Dodge Aries Dodge Daytona Dodge Diplomat Dodge Lancer Dodge 600 【Dodge Stealth*】 Plymouth Caravelle Plymouth Laser Plymouth Gran Fury Plymouth Reliant
【Consulier	Consulier GTP*】
Ferrari	Mondial 8 308 328
Ford	Ford Mustang Ford Thunderbird Ford Probe Mercury Capri Mercury Cougar Lincoln Continental Lincoln Mark Lincoln Town Car Merkur Scorpio Merkur XR4Ti
General Motors	Buick Electra Buick LeSabre Buick Reatta Buick Regal Buick Riviera Cadillac DeVille Cadillac Eldorado Cadillac Seville Chevrolet Nova Chevrolet Lumina Oldsmobile Cutlass Supreme Oldsmobile Delta 88 Oldsmobile 98 Oldsmobile Toronado Pontiac Bonneville Pontiac Fiero Pontiac Grand Prix Geo Prizm Geo Storm
Isuzu	90JZ Impulse 【90JX* Stylus】
Jaguar	XJ XJ-6 XJ-40
Lotus	M100 【Lotus Elan*】
Maserati	Biturbo Quattroporte 228
Mazda	GLC 626 MX-6 MX-5 Miata
Mercedes-Benz	190 D/E 250D-T 260 E 300 CE 300 D/E 300 SE 300 SL 300 TD 300 TE 300 SDL 300 SEL 380 SEC/500 SEC 380 SEL/500 SEL 380 SL 420 SEL 500 SL 560 SEL 560 SEC 560 SL
Mitsubishi	Cordia Tredia Eclipse 【3000GT*】

PART 541—Appendix A—Continued

Lines subject to the requirements of Part 541

Manufacturer	*Subject Lines*
Peugeot	405
Porsche	924S
Reliant	SS1
Saab	900
Subaru	XT
Toyota	Camry Celica Corolla/Corolla Sport MR2 Starlet
Volkswagen	Audi Quattro Volkswagen Cabriolet Volkswagen Rabbit Volkswagen Scirocco Volkswagen Corrado

* Lines added in Model Year 1991

(55 F.R. 37326—September 11, 1990. Effective: September 11, 1990)

PART 541—Appendix A-I

High-Theft Lines With Antitheft Devices That are Exempted from the Requirements of This Standard Pursuant to 49 CFR Part 543

Manufacturer	*Exempted Lines*
Austin Rover	Sterling
BMW	7 Car line
Chrysler	Chrysler Conquest
Chrysler	Imperial
General Motors	Cadillac Allante Chevrolet Corvette
[Honda	Acura NS-X** Acura Legend**]
Isuzu	Impulse
Mazda	929 RX 7
Mitsubishi	Galant Starion
Nissan	Maxima 300 ZX Infiniti M30 Infiniti Q45
Porsche	911 928
Saab	9000
Toyota	Supra Cressida Lexus LS400 Lexus ES250
Volkswagen	Audi 500S Audi 100 Audi 200
Volvo	480ES

** [illegible] Part 541 pursuant to 49 CFR Part 543 in [illegible]

(55 F.R. 37326—September 11, 1990—Effective: September 11, 1990)]

PART 541—Appendix A-II

High Theft Lines With Antitheft Devices That are Exempted in Part From the Parts-Marking Requirements of This Standard Pursuant to 49 CFR Part 543

Manufacturer	*Exempted Lines*	*Parts Marked*
General Motors	Chevrolet Camaro	Engine, Transmission
	Pontiac Firebird	Engine, Transmission
	[Cadillac Deville-Fleetwood***	Engine, Transmission
	Oldsmobile 98***	Engine, Transmission]

*** Received partial exemptions from the requirements of PART 541 pursuant to 49 CFR Part 543 in MY 1990.

(55 F.R. 37326—September 11, 1990—Effective: September 11, 1990)]

PREAMBLE TO AN AMENDMENT TO PART 567

Certification
(Docket No. 91-24; Notice 1)

ACTION: Technical amendments; final rule.

SUMMARY: This notice makes several technical amendments to conform the language of Part 567, Certification, to new regulations, issued in September 1989, regarding the importation of motor vehicles not originally manufactured in compliance with the Federal Motor Vehicle Safety Standards. As amended, Part 567 cites the new regulations, instead of the prior ones, and refers to "Registered Importers" instead of "importers."

EFFECTIVE DATE: The amendments are effective on May 15, 1991.

SUPPLEMENTARY INFORMATION: The Imported Vehicle Safety Compliance Act of 1988, (the 1988 Act), Public Law 100-562, amended the National Traffic and Motor Vehicle Safety Act (the Vehicle Safety Act) to give the Department of Transportation sole rulemaking authority regarding regulations governing the importation of vehicles not originally manufactured to comply with the Federal motor vehicle safety standards. Among the amendments made by the 1988 Act were ones revoking sections 108(b)(3) and (b)(4) of the Vehicle Safety Act, effective January 31, 1990. These sections authorized the issuance of regulations jointly by the Secretaries of Transportation and Treasury to prohibit the importation of motor vehicles and equipment not complying with the Federal motor vehicle safety standards, except under such terms and conditions as the two Departments may specify to ensure that a noncomplying vehicle or equipment item will be brought into conformance or will be exported or abandoned to the United States. Pursuant to this authority, the two Secretaries issued an implementing regulation, 19 CFR 12.80, which governed the importation of merchandise subject to Federal motor vehicle safety standards beginning in 1968, and continued to do so through January 31, 1990. In place of the deleted sections, the 1988 Act added new sections which include authority vested alone in the Secretary of Transportation to establish new regulations regarding importation.

In addition, the 1988 Act amended the Vehicle Safety Act to permit a motor vehicle not originally manufactured to conform to Federal motor vehicle safety standards to be imported only by a person who has registered with this agency, or by an individual who has a contract with a registered importer for making the modifications necessary for bringing the vehicle into conformance with applicable safety standards.

Pursuant to the amendments made to the Vehicle Safety Act by the 1988 Act, the agency issued final rules on September 29, 1989, establishing 49 CFR Part 591, "Importation of Vehicles and Equipment Subject to Federal Motor Vehicle Safety Standards" (54 F.R. 40078), and Part 592, "Registered Importers of Vehicles Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards" (54 F.R. 40063). Part 591 superseded the prior joint regulation of the Departments of Treasury and Transportation on importation statements and documentation at 19 CFR § 12.80 promulgated jointly by the Customs Service, Department of the Treasury, and NHTSA. In Part 592, the agency set forth procedures and requirements regarding the registration of importers and the duties and obligations of Registered Importers.

To supplement those 1989 final rules, the agency needs to make conforming amendments to another NHTSA regulation referring to or relying on NHTSA's importation regulations. Specifically, it desires to amend 49 CFR Part 567, "Certification." Part 567 specifies requirements for certification by manufacturers, including importers, of the compliance of motor vehicles with applicable Federal Motor Vehicle Safety Standards, the Bumper Standard (Part 581) and the Theft Prevention Standard (Part 541), as required by Section 114 of the Vehicle Safety Act (15 U.S.C. 1403) and by sections 105(c)(1) and 606(c) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C.

1915(c) and 2026(c)). Part 567 contains special certification requirements for importers of motor vehicles that were not originally manufactured to conform to the Federal Motor Vehicle Safety Standards and Theft Prevention Standard, but are nevertheless presented for importation into the United States. However, those special requirements currently contain references to 19 CFR § 12.80 instead of Part 592, and to "importers," instead of "Registered Importers."

This notice amends Part 567 to reflect the supersession of 19 CFR § 12.80 by Part 591 and the necessity for an importer to be a Registered Importer or to have a contract for modification with a Registered Importer.

1. Section 567.2(b) is revised to read as follows:

(b) In the case of imported motor vehicles, the requirement of affixing a label or tag applies to Registered Importers of vehicles admitted to the United States under 49 CFR 591.5(f) to which the required label or tag is not affixed.

§ 567.4 [Amended]

2. The last sentence of Section 567.4(g)(1) is revised to read as follows:

(g)(1) * * * In the case of imported vehicles, where the label required by this section is affixed by the Registered Importer, the name of the Registered Importer shall also be placed on the label in the manner described in this paragraph, directly below the name of the final assembler.

3. The first sentence of Section 567.4(1)(1) is revised to read as follows:

(1)(1) In the case of a passenger car imported into the United States under 49 CFR 591.5(f) which does not have an identification number that complies with paragraph S4.2, S4.3, and S4.7 of 49 CFR 571.115 at the time of importation, the Registered Importer shall permanently affix a label to the vehicle in such a manner that, unless the label is riveted, it cannot be removed without being destroyed or defaced. * * *

Issued on: May 10, 1991

Jerry Ralph Curry
Administrator

56 F.R. 22355
May 15, 1991

PART 567—CERTIFICATION

(Dockets No. 73-31 and 75-28)

§ 567.1 Purpose.

The purpose of this part is to specify the content and location of, and other requirements for, the certification label or tag to be affixed to motor vehicles as required by section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C.1403) (the Safety Act) and by sections 105(c) (1) and 606 (c) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1915(c) and 2026(c))(the Cost Savings Act), and to provide the consumer with information to assist him or her in determining which of the Federal Motor Vehicle Safety Standards (Part 571 of this chapter) and Federal Theft Prevention Standards (Part 541 of this chapter) (standards) are applicable to the vehicle.

§ 567.2 Application.

(a) This part applies to manufacturers and distributors of motor vehicles to which one or more standards are applicable.

(b) [In the case of imported motor vehicles, the requirement of affixing a label or tag applies to Registered Importers of vehicles admitted to the United States under 49 CFR 591.5(f) to which the required label or tag is not affixed. **(56 F.R. 22355—May 15, 1991. Effective: May 15, 1991)**]

§ 567.3 Definitions.

All terms that are defined in the Act and the rules and standards issued under its authority are used as defined therein. The term "bumper" has the meaning assigned to it in Title I of the Cost Savings Act and the rules and standards issued under its authority.

"Chasis-cab" means an incomplete vehicle, with a completed occupant compartment, that requires only the addition of cargo-carrying, work-performing, or load-bearing components to perform its intended functions.

§ 567.4 Requirements for manufacturers of motor vehicles.

(a) Each manufacturer of motor vehicles (except vehicles manufactured in two or more stages) shall affix to each vehicle a label, of the type and in the manner described below, containing the statements specified in paragraph (g) of this section.

(b) The label shall, unless riveted, be permanently affixed in such a manner that it cannot be removed without destroying or defacing it.

(c) Except for trailers and motorcycles, the label shall be affixed to either the hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position, or if none of these locations is practicable, to the left side of the instrument panel. If that location is also not practicable, the label shall be affixed to the inward-facing surface of the door next to the driver's seating position. If none of the preceding locations is practicable, notification of that fact, together with drawings or photographs showing a suggested alternate location in the same general area, shall be submitted for approval to the Administrator, National Highway Traffic Safety Administration, Washington, D.C. 20590. The location of the label shall be such that it is easily readable without moving any part of the vehicle except an outer door.

(d) The label for trailers shall be affixed to a location on the forward half of the left side, such that it is easily readable from outside the vehicle without moving any part of the vehicle.

(e) The label for motorcycles shall be affixed to a permanent member of the vehicle as close as is practicable to the intersection of the steering post with the handle bars, in a location such that it is easily readable without moving any part of the vehicle except the steering system.

(f) The lettering on the label shall be of a color that contrasts with the background of the label.

(g) The label shall contain the following statements, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high, in the order shown:

(1) Name of manufacturer: Except as provided in (i), (ii), and (iii) below, the full corporate or individual name of the actual assembler of the vehicle shall be spelled out, except that such abbreviations as "Co." or "Inc." and their foreign equivalents, and the first and middle initials of individuals, may be used. The name of the manufacturer shall be preceded by the words "Manufactured By" or "Mfd By." In the case of imported vehicles, where the label required by this section is affixed by the Registered Importer, the name of the Registered Importer shall also be placed on the label in the manner described in this paragraph, directly below the name of the final assembler. **(56 F.R. 22355—May 15, 1991. Effective: May 15, 1991)**

(i) If a vehicle is assembled by a corporation that is controlled by another corporation that assumes responsibility for conformity with the standards, the name of the controlling corporation may be used.

(ii) If a vehicle is fabricated and delivered in complete but unassembled form, such that it is designed to be assembled without special machinery or tools, the fabricator of the vehicle may affix the label and name itself as the manufacturer for the purposes of this section.

(iii) If a trailer is sold by a person who is not its manufacturer, but who is engaged in the manufacture of trailers and assumes legal responsibility for all duties and liabilities imposed by the Act with respect to that trailer, the name of that person may appear on the label as the manufacturer. In such a case the name shall be preceded by the words "Responsible Manufacturer" or "Resp Mfr."

(2) Month and year of manufacture: This shall be the time during which work was completed at the place of main assembly of the vehicle. It may be spelled out, as "June 1970," or expressed in numerals, as "6/70."

(3) "Gross Vehicle Weight Rating" or "GVWR" followed by the appropriate value in pounds, which shall not be less than the sum of the unloaded vehicle weight, rated cargo load, and 150 pounds times the vehicle's designated seating capacity. However, for school buses the minimum occupant weight allowance shall be 120 pounds.

(4) "Gross Axle Weight Rating" or "GAWR" followed by the appropriate value in pounds, for each axle, identified in order from front to rear (e.g., front, first intermediate, second intermediate, rear). The ratings for any consecutive axles having identical gross axle weight ratings when equipped with tires having the same tire size designation may, at the option of the manufacturer, be stated as a single value, with the label indicating to which axles the ratings apply.

EXAMPLES OF COMBINED RATINGS GAWR:

(a) All axles—4080 with 7.00–15 LT(D) tires.

(b) Front—12,000 with 10.00–20 (G) tires.
First intermediate to rear—15,000 with 12.00–20 (H) tires.

(5) The statement: "This vehicle conforms to all applicable Federal motor vehicle safety standards in effect on the date of manufacture shown above." The expression "U.S." or "U.S.A." may be inserted before the word "Federal."—

(i) In the case of passenger cars manufactured on or after September 1, 1978, the expression "and bumper" shall be included in the statement following the word "safety."

(ii) In the case of 1987 and subsequent model year passenger cars manufactured on or after April 24, 1986 the expression "safety, bumper, and theft prevention" shall be substituted in the statement for the word "safety."

(6) Vehicle identification number.

(7) The type classification of the vehicle as defined in § 571.3 of Title 49 of the Code of Federal Regulations (*e.g.*, truck, MPV, bus, trailer).

(h) Multiple GVWR-GAWR ratings.

(1) (For passenger cars only) In cases where different tire sizes are offered as a customer option, a manufacturer may at his option list more than one set of values for GVWR and GAWR, in response to the requirements of paragraphs (g) (3) and (4) of this section. If the label shows more than one set of weight rating values, each value shall be followed by the phrase "with ______ tires," inserting the proper tire size designations. A manufacturer may at his option list one or more tire sizes where only one set of weight ratings is provided.

Passenger Car Example

GVWR:

4400 LB with G78–14B Tires. 4800 LB with H78–14B Tires.

GAWR:

Front—2000 LB with G78–14B Tires at 24 psi, 2200 LB with H78–14B Tires at 24 psi.

Rear—2400 LB with G78–Tires at 28 psi, 2600 LB with H78–14B Tires at 28 psi.

(2) (For multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles) The manufacturer may, at its option, list more than one GVWR–GAWR-tire-rim-combination on the label, as long as the list conforms in content and format to the requirements for tire rim-inflation information set forth in Standard No. 120 of this chapter (§ 571.120).

(3) At the option of the manufacturer, additional GVWR–GAWR ratings for operation of the vehicle at reduced speeds may be listed at the bottom of the certification label following any information that is required to be listed.

(i) **Reserved**

(j) A manufacturer may, at his option, provide information concerning which tables in the document that accompanies the vehicle pursuant to § 575.6(a) of this chapter apply to the vehicle. This information may not precede or interrupt the information required by paragraph (g).

(k) In the case of passenger cars admitted to the United States under 19 CFR 12.80(b) (1) to which the label required by this section has not been affixed by the original producer or assembler of the passenger car, a label meeting the requirements of this paragraph shall be affixed by the importer before the vehicle is imported into the United States, if the car is from a line listed in Appendix A of Part 541 of this chapter. This label shall be in addition to, and not in place of, the label required by paragraphs (a) through (j), inclusive, of this part.

(1) The label shall, unless riveted, be permanently affixed in such a manner that it cannot be removed without destroying or defacing it.

(2) The label shall be affixed to either the hinge pillar, door-latch post, or the door edge that meets the door-latch post, next to the driver's seating position, or, if none of these locations is practicable, to the left side of the instrument panel. If that location is also not practicable, the label shall be affixed to the inward-facing surface of the door next to the driver's seating position. The location of the label shall be such that it is easily readable without moving any part of the vehicle except an outer door.

(3) The lettering on the label shall be of a color that contrasts with the background of the label.

(4) The label shall contain the following statements, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high, in the order shown:

(i) Model year (if applicable) or year of manufacture and line of the vehicle, as reported by the manufacturer that produced or assembled the vehicle. "Model year" is used as defined in § 565.3(h) of this chapter. "Line" is used as defined in § 541.4 of this chapter.

(ii) Name of the importer: The full corporate or individual name of the importer of the vehicle shall be spelled out, except that such abbreviations as "Co." or "Inc." and their foreign equivalents and the middle initial of individuals, may be used. The name of the importer shall be preceded by the words "Imported By."

(iii) The statement: "This vehicle conforms to the applicable Federal motor vehicle theft prevention standard in effect on the date of manufacture."

(l) (1) [In the case of a passenger car imported into the United States under 49 CFR 591.5(f) which does not have an identification number that complies with paragraph S4.2, S4.3, and S4.7 of 49

CFR 571.115 at the time of importation, the Registered Importer shall permanently affix a label to the vehicle in such a manner that, unless the label is riveted, it cannot be removed without being destroyed or defaced. The label shall be in addition to the label required by subsection (a) of this section, and shall be affixed to the vehicle in a location specified in subsection (c) of this section. **(56 F.R. 22355—May 15, 1991. Effective: May 15, 1991.)]**

(2) The label shall contain the following statement, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high, with the location on the vehicle of the original manufacturer's identification number provided in the blank: ORIGINAL MANUFACTURER'S IDENTIFICATION NUMBER SUBSTITUTING FOR U.S. VIN. IS LOCATED ________________.

§ 567.5 Requirements for manufacturers of vehicles manufactured in two or more stages.

(a) Except as provided in paragraph (e) of this section, each manufacturer of a chassis-cab shall affix a label to each chassis-cab manufactured on or after July 25, 1978, in the location and form specified in § 567.4, that contains the following statements, to the extent that they are applicable.

(1) "This chassis-cab conforms to Federal Motor Vehicle Safety Standard Nos. ______________." The statement shall be completed by inserting the numbers of the safety standards (*e.g.*, 101, 207) to which the chassis-cab conforms.

(2) "This vehicle will conform to Standard Nos. ______________ if it is completed in accordance with the instructions contained in the incomplete vehicle document furnished pursuant to 49 CFR Part 568." The statement shall be completed by inserting the numbers of the safety standards conformity to which is substantially affected by both the design of the chassis-cab and the manner in which the vehicle is completed (*i.e.*, the standards listed under category (ii) in paragraph 568.4(a) (7) of this chapter).

(3) "Conformity to the other safety standards applicable to this vehicle when completed is not substantially affected by the design of the chassis-cab."

(4) Name of chassis-cab manufacturer preceded by the words "CHASSIS-CAB MANUFACTURED BY" or "CHASSIS-CAB MFD BY."

(5) Month and year of manufacture of chassis-cab. This may be spelled out, as in "June 1970," or expressed in numerals, as in "6/70." No preface is required.

(b) Except as provided in paragraphs (e) and (f) of this section, each intermediate manufacturer of a vehicle manufactured in two or more stages shall affix a label, in the location and form specified in § 567.4, to each chassis-cab respecting which he is required by § 568.5 to furnish an addendum to the incomplete vehicle document described in § 568.4. However, this paragraph applies only to chassis-cabs that have been certified by a chassis-cab manufacturer in accordance with paragraph (a) of this section. The label shall contain the following statements as appropriate:

(1) (i) "With respect to Standard Nos. ________, the instructions of prior manufacturers have been followed so that the chassis-cab now conforms to these standards." The statement shall be completed by inserting the numbers of all or less than all of the standards, and only those standards, respecting which the latest prior certification statement was in the form prescribed in paragraphs (a) (2) or (b) (2) of this section.

(ii) "This chassis-cab conforms to Federal Motor Vehicle Safety Standard Nos. ________." The statement shall be completed by inserting the numbers of the other standards to which the chassis-cab conforms, excluding those standards respecting which the latest prior certification statement was in the form prescribed in paragraphs (a) (1), (b) (1) (i), or this paragraph.

(2) "This vehicle will conform to Standard Nos. ________ if it is completed in accordance with the instructions contained in the amended incomplete vehicle document furnished pursuant to 49 CFR Part 568." The statement shall be completed by inserting the numbers of the standards conformity to which is substantially affected by both the design of the chassis-cab (as modified by the intermediate manufacturer) and the manner in which the vehicle is completed.

PREAMBLE TO AN AMENDMENT TO PART 572 and FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213

Anthropomorphic Test Dummies (Docket No. 89–13; Notice 2) RIN 2127–AB94

ACTION: Final rule.

SUMMARY: This notice amends NHTSA's specifications for the 3-year-old-child test dummy NHTSA uses to test child restraint systems. Specifications are provided for a new head which has a higher natural frequency response, and is therefore better suited for compliance testing than the present head assembly. In addition, generic specifications are set for two different types of accelerometers which may be used with the dummy.

DATES: The effective date for making these amendments to the CFR is August 27, 1990.

Until September 1, 1993, each 3-year-old-child test dummy NHTSA uses to test an add-on child restraint will incorporate, at the manufacturer's option, either the new head assembly specified in §572.16(a)(1) or the old head assembly specified in §572.16(a)(2).

Effective September 1, 1993, each 3-year-old-child dummy NHTSA uses to test an add-on child restraint will incorporate the new head assembly specified in §572.16(a)(1).

Beginning August 27, 1990, each 3-year-old-child dummy NHTSA uses to test a built-in child restraint incorporate's the new head assembly specified in §572.16(a)(1).

SUPPLEMENTARY INFORMATION:

Background. On July 11, 1989, NHTSA published a notice of proposed rulemaking (NPRM) concerning changes to the agency's specifications for the 3-year-old-child test dummy (54 FR 29071).

First, the agency proposed a new head assembly for the test dummy. The agency also proposed that, if the new specifications were adopted, dummies conforming to them would be used by the agency when evaluating both add-on and built-in restraints. (A built-in child restraint is one that is an integral part of a vehicle.)

This proposal was developed following the implementation on January 22, 1988 of amendments to Standard No. 213 establishing performance and test criteria expressly applicable to built-in restraint systems. Prior to that date, Standard 213 specified performance and test criteria suitable for add-on child restraint systems only. (An add-on restraint is any portable child restraint system.) In tests of add-on systems, the test environment is a standard vehicle seat assembly to which the restraint is attached by a lap belt. During testing, the dummy's head does not contact a rigid surface which is not part of the child restraint system.

During compliance testing of built-in restraint systems, the dummy's head may contact a rigid surface, because the performance of the built-in restraint in protecting the child is determined by testing the restraint in proximity to other parts of the vehicle interior, which may include rigid surfaces. The current head of the 3-year-old-dummy has a relatively low natural frequency response, which may cause it to give unreliable data when the head contacts a rigid surface. The agency believed there was an apparent need to adopt a head that has a natural frequency response (the frequency of a free vibration at which an elastic system starts to vibrate when impacted by a force) appropriate for measuring acceleration resulting from impact between the dummy head and rigid surfaces. (Issues relating to the reliability and validity of the new head as a test device were thoroughly discussed in the NPRM and will not be repeated here.)

Second, the agency proposed two different types of generically designated accelerometers based on frequency response characteristics and location specifications within the dummy. Any accelerometer system conforming with these specifications could be used with the dummy. NHTSA proposed the generic accelerometer specifications because manufacture of the particular accelerometer model specified in Part 572 has been discontinued, and because NHTSA tentatively concluded there was no necessity to specify another particular model for use in compliance testing. Any accelerometer that meets the proposed specifications, and is positioned in the test dummy at the specified reference points so that the seismic masses of each sensing element would be

aligned with the head and thoracic reference points, would give the same measurements as any other accelerometer with the equivalent impact response characteristics and positioning. NHTSA believed that generic accelerometer specifications would avoid difficulties associated with a particular accelerometer model when the manufacture of that model is discontinued.

Comments on the NPRM

New head design

NHTSA received six comments on the proposed changes. The University of Michigan (UM) strongly urged that the agency adopt the new head. The University said that UM has been using the new head in child restraint tests since the early 1980's, and because of the existing head's low natural frequency, would not consider returning to the use of the old design. Volvo Cars of North America also supported the proposed change to the new head, stating that "the change of material in the dummy head will avoid some of the interfering noise occurring in the old dummy head due to its low material frequency."

General Motors Corporation (GM) submitted initial and supplemental comments on the NPRM. In its initial comment, GM said it had yet to test the proposed dummy head, but expressed concern that "the 3-year-old-child dummy, with or without the new head, still lacks a reasonable level of impact response biofidelity." (GM's comment reflects the fact that, after NHTSA established specifications for the 3-year-old-child test dummy in 1979, GM petitioned the agency to reconsider whether the specified dummy was an appropriate test device. NHTSA analyzed GM's concerns about the dummy and found them to be without merit. Accordingly, the agency denied the petition (45 FR 82265; December 15, 1980).) GM did not provide any data or information in its initial comment to the NPRM that convincingly established that NHTSA should refrain from using the 3-year-old-child test dummy to test child restraint systems. In its supplemental comment, GM stated that it tested the proposed head assembly and found that head accelerations met the proposed calibration levels when a light coat of a silicone lubricant was applied between the head skin and skull prior to the test. Applying a lubricant is recognized by the Society of Automotive Engineers (SAE) as an acceptable practice and is used by the industry to bring other Part 572 test dummies into calibration specifications. GM stated that it agreed with the proposed specification and use of the new head assembly on the 3-year-old-child test dummy.

Ford supported the agency's objective of improving the testing capability of the 3-year-old-child dummy, but was concerned that the natural frequency of the proposed fiberglass head "still may have too low a natural frequency to eliminate ringing." Ford seemed to believe that the new head has a natural frequency "just above 1000 Hz," which would cause mechanical ringing of the head at or near that frequency in certain impacts. The commenter suggested that NHTSA consider developing a new dummy head with a structure of aluminum or magnesium, "to provide a natural frequency well above 1000 Hz."

Ford apparently was not aware that the natural frequency of the new head is 3,300 Hz, which is 3.3 times higher than the nominal class 1,000 filter cut-off frequency referenced in §572.21 and specified by the SAE for head impact response measurements ("Performance Measurements of Three-Year-Old-Child Test Dummy Heads, December 1983; Report No. DOT HS 806–742). That natural frequency is considerably higher than that of the current head (400 Hz). Because the adequacy of the new head has been established by NHTSA testing, and because no information has arisen showing problems with the new head, the agency believes the new dummy head is completely suitable for use in the 3-year-old child dummy.

The NPRM proposed that NHTSA would continue testing add-on restraints with the present dummy head or the new head, at the manufacturer's option, for 3 years. The NPRM proposed that, after the 3-year period, NHTSA would test all add-on child restraints with dummies incorporating the new head assembly. The agency explained in the NPRM that it sought to have, eventually, only one head assembly for the 3-year-old-child dummy, to preclude inadvertent use of the current head assembly in a compliance test of a built-in restraint.

Ford requested that the agency permit indefinite use of the present dummy head, rather than limit such use to a 3-year period. Ford said that there is little risk that the wrong head would be mistakenly used, particularly if the new head is composed of aluminum or magnesium, materials unlike in appearance to the current (urethane) dummy head.

NHTSA disagrees with Ford that the agency's compliance procedures should permit the indefinite use of the present dummy head. Since the new head will be composed from fiberglass (and not the aluminum and magnesium materials Ford suggested) and is outwardly identical to the current head assembly, it is important that the agency reduce the likelihood that the present head could be inadvertently used in a compliance test of a built-in restraint system. Such errors would represent a needless waste of time and resources. With respect to add-on restraints, those that pass a Standard 213 compliance test when tested with a dummy incorporating the existing

head should also pass when tested with a dummy using the new head. Thus, there is no apparent advantage to retaining the old head beyond the 3 year period. Further, test dummy heads, on average, must be replaced after approximately 3 years due to the wear from testing and the aging of the rubbers and plastics in the head. Thus, the 3 year transition period before use of the new head assembly is mandated should not impose any burdens on the dummy users. Testing facilities could continue using the current head assemblies during the 3 year transition period and could purchase the new head assemblies when the current head assemblies must be replaced.

Ford and GM highlighted sections of the proposed regulatory language where typographical or editorial corrections were appropriate. NHTSA has adopted these suggestions. In addition, Ford asked the agency to make it clear that, during the 3 year period when optional use of either head is permitted, NHTSA's compliance testing would be conducted using the type of dummy head that the add-on child restraint manufacturer chose to use in certifying its restraint system. NHTSA does not object to using the same type of head, and has revised the text of S7.2 of Standard 213 to specify that the type of head used in compliance tests during the 3 year period is at the manufacturer's option.

Proposed specifications for the accelerometer

All comments relating to the proposed adoption of generic specifications for the accelerometer were supportive of the proposal. Ford suggested minor changes to the regulatory language to clarify specifications or correct typographical errors. The agency agrees with these recommendations, and has adopted the generic specifications proposed in the NPRM, as revised by Ford's suggested changes.

Effective date

The effective date for making these amendments to the CFR is 30 days from the date of publication.

Beginning 30 days after publication of the final rule, each 3-year-old-child test dummy NHTSA uses to test a built-in child restraint will be assembled with the new head assembly specified in §572.16(a)(1). The higher natural frequency response of the new head assembly will ensure that the head acceleration measurements taken during testing of built-in child restraints are accurate and reliable. Because of the need for accurate and reliable head acceleration measurements, the agency finds that this effective date of less than 180 days is in the public interest.

For add-on restraints, the NPRM proposed that manufacturers would have the option of specifying the use of the current or new head assembly in NHTSA compliance testing, beginning 30 days after publication of the final rule, "until three years after publication of a final rule." Permitting optional use of the proposed head assembly beginning 30 days after publication will not impose any burdens on any party, and will further the public interest by allowing manufacturers to gain experience with the new head assembly. Thus, NHTSA again finds good cause for such an effective date.

Although the NPRM did not identify the exact date 3 years after publication of a final rule from which use of the present head assembly in NHTSA's compliance tests will cease, such a date must be specified in Standard 213 so that all persons reading the standard can readily know how NHTSA conducts its testing. This final rule specifies this date as September 1, 1993. The agency has determined that this date is appropriate because it is approximately 3 years after the date of anticipated issuance of this final rule, and consistent with the date the NPRM proposed.

In consideration of the foregoing, NHTSA amends 49 CFR Parts 571 and 572 as follows:

S7.2 of §571.213 is revised to read as follows:

S7.2 *Three-year-old-child dummy.* A three-year-old-child dummy conforming to Subpart C of Part 572 of this chapter is used for testing a child restraint that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing more than 20 pounds.

(a) *Built-in child restraints.* When a three-year-old-child test dummy is used for testing a built-in child restraint, the dummy shall be assembled with the head assembly specified in §572.16(a)(1).

(b) *Add-on child restraints.* Until September 1, 1993, when a three-year-old-child test dummy is used for testing an add-on child restraint, the dummy shall be assembled using, at the manufacturer's option, either head assembly specified in §572.16(a).

Effective September 1, 1993, when a three-year-old-child dummy is used for testing an add-on child restraint, the dummy shall be assembled with the head assembly specified in §572.16(a)(1).

* * * * *

PART 572—ANTHROPOMORPHIC TEST DUMMIES

1. The authority citation for Part 572 continues to read as follows:

Authority: 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.50.

Subpart C—3-Year-Old Child

2. Paragraphs (a) and (b) of section 572.16 are revised to read as follows:

§572.16 Head.

(a) The head consists of the assembly designated

as SA 103C 010 on drawing no. SA 103C 001, and conforms to either—

(1) each item specified on drawing SA 103C 002(B), sheet 8; or

(2) each item specified on drawing SA 103C 002, sheet 8.

(b) When the head is impacted by a test probe specified in §572.21(a)(1) at 7 fps, then the peak resultant acceleration measured at the location of the accelerometer mounted in the headform according to §572.21(b) is not less than 95g and not more than 118g.

(1) The recorded acceleration-time curve for this test is unimodal at or above the 50g level, and lies at or above that level for intervals:

(i) in the case of the head assembly specified in paragraph (a)(1) of this section, not less than 1.3 milliseconds and not more than 2.0 milliseconds;

(ii) in the case of the head assembly specified in paragraph (a)(2) of this section, not less than 2.0 milliseconds and not more than 3.0 milliseconds.

(2) The lateral acceleration vector does not exceed 7g.

* * * * *

Section 572.17(a) is revised to read as follows:

§572.17 Neck.

(a)(1) The neck for use with the head assembly described in §572.16(a)(1) consists of the assembly designated as SA 103C 020 on drawing No. SA 103C 001, and conforms to each item specified on drawing No. SA 103C 002(B), sheet 9.

(2) The neck for use with the head assembly described in §572.16(a)(2) consists of the assembly designated as SA 103C 020 on drawing No. SA 103C 001, and conforms to each item specified on drawing No. SA 103C 002, sheet 9.

* * * * *

Section 572.21 is amended by revising paragraphs (a), (b), and (c) to read as follows:

§572.21 Test conditions and instrumentation.

(a)(1) The test probe used for head and thoracic impact tests is a cylinder 3 inches in diameter, 13.8 inches long, and weighing 10 lbs., 6 ozs. Its impacting end has a flat right face that is rigid and that has an edge radius of 0.5 inches.

(2) The head and thorax assembly may be instrumented with a Type A or Type C accelerometer.

(i) Type A accelerometer is defined in drawing SA–572 S1.

(ii) Type C accelerometer is defined in drawing SA–572 S2.

(b) *Head Accelerometers.* Install one of the triaxial accelerometers specified in §572.21(a)(2) on a mounting block located on the horizontal transverse bulkhead as shown in the drawings subreferenced under assembly SA 103C 010 so that the seismic mass centers of each sensing element are positioned as specified in this paragraph, relative to the head accelerometer reference point located at the intersection of a line connecting the longitudinal centerlines of the transfer pins in the side of the dummy head with the midsagittal plane of the dummy head.

(1) The sensing elements of the Type C triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and coincident with the midsagittal plane, with the seismic mass center located 0.2 inches dorsal to, and 0.1 inches inferior to the head accelerometer reference point.

(ii) Align the second sensitive axis with the horizontal plane, perpendicular to the midsagittal plane, with the seismic mass center located 0.1 inches inferior, 0.4 inches to the right of, and 0.9 inches dorsal to the head accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.1 inches inferior to, 0.6 inches dorsal to, and 0.4 inches to the right of the head accelerometer reference point.

(iv) All seismic mass centers are positioned with ±0.05 inches of the specified locations.

(2) The sensing elements of the Type A triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and coincident with midsagittal planes, with the seismic mass center located from 0.2 to 0.47 inches dorsal to, from 0.01 inches inferior to 0.21 inches superior, and from 0.0 to 0.17 inches left of the head accelerometer reference point.

(ii) Align the second sensitive axis with the horizontal plane, perpendicular to the midsagittal plane, with the seismic mass center located 0.1 to 0.13 inches inferior to, 0.17 to 0.4 inches to the right of, and 0.47 to 0.9 inches dorsal of the head accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.1 to 0.13 inches inferior to, 0.6 to 0.81 inches dorsal to, and from 0.17 inches left to 0.4 inches right of the head accelerometer reference point.

(c) *Thorax Accelerometers.* Install one of the triaxial accelerometers specified in §572.21(a)(2) on a mounting plate attached to the vertical transverse bulkhead shown in the drawing subreferenced under assembly No. SA 103C 030 in drawing SA 103C 001, so that the seismic mass centers of each sensing element are positioned as specified in this paragraph, relative to the thorax accelerometer reference

point located in the midsagittal plane 3 inches above the top surface of the lumbar spine, and 0.3 inches dorsal to the accelerometer mounting plate surface.

(1) The sensing elements of the Type C triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and midsagittal planes, with the seismic mass center located 0.2 inches to the left of, 0.1 inches inferior to, and 0.2 inches ventral to the thorax accelerometer reference point.

(ii) Align the second sensitive axis so that it is in the horizontal transverse plane, and perpendicular to the midsagittal plane, with the seismic mass center located 0.2 inches to the right of, 0.1 inches inferior to, and 0.2 inches ventral to the thorax accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.2 inches superior to, 0.5 inches to the right of, and 0.1 inches ventral to the thorax accelerometer reference points.

(iv) All seismic mass centers shall be positioned within ± 0.05 inches of the specified locations.

(2) The sensing elements of the Type A triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and midsagittal planes, with the seismic mass center located from 0.2 inches left to 0.28 inches right, from 0.5 to 0.15 inches inferior to, and from 0.15 to 0.25 inches ventral of the thorax accelerometer reference point.

(ii) Align the second sensitive axis so that it is in the horizontal transverse plane and perpendicular to the midsagittal plane, with the seismic mass center located from 0.06 inches left to 0.2 inches right of, from 0.1 inches inferior to 0.24 inches superior, and 0.15 to 0.25 inches ventral to the thorax accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.15 to 0.25 inches superior to, 0.28 to 0.5 inches to the right of, and from 0.1 inches ventral to 0.19 inches dorsal to the thorax accelerometer reference point.

Issued on July 20, 1990.

Jerry Ralph Curry
Administrator

55 FR 30465
July 26, 1990

PREAMBLE TO AN AMENDMENT TO PART 572

Side Impact Protection Anthropomorphic Test Dummy
(Docket No. 88-07; Notice 3)
RIN 2127-AA48

ACTION—Final rule.

SUMMARY: This notice establishes specifications for the side impact dummy that is to be used in the full-scale dynamic crash test specified under amendments to Standard No. 214, *Side Door Strength*, which appear elsewhere in today's *Federal Register*. The specifications for the side impact dummy are set forth in a new subpart F of Part 572, *Anthropomorphic Test Dummies*. The agency is specifying the side impact dummy (SID) that it proposed in January 1988. The agency notes that two alternative dummies, BioSID and EuroSID, are under development. The agency believes that these dummies may become available as regulatory test devices in the future. These dummies can measure the same injury criteria as SID, but also offer the advantage of measuring additional injury criteria. If ongoing studies demonstrate that one or both of these dummies compare satisfactorily to the SID, the agency will consider proposing such dummies as alternative devices in the future.

DATES: The amendments made by this rule to the Code of Federal Regulations are effective November 29, 1990. The new Standard No. 214 requirements which specify use of the side test dummy are phased in over a three-year period, beginning on September 1, 1993.

SUPPLEMENTARY INFORMATION:

Background

On January 27, 1988, NHTSA published in the *Federal Register* (53 FR 2239) a notice of proposed rulemaking (NPRM) to add procedures and performance requirements for a new dynamic test to Standard No. 214, *Side Door Strength*. In the proposed additional test, a passenger car must provide protection in a full-scale crash test in which the car (known as the "target" car) is struck in the side by a moving deformable barrier simulating another vehicle.

The proposed test procedure included placing anthropomorphic test dummies in the outboard front and rear seats of the target car to measure the potential for injuries to an occupant's thorax and pelvis. For the thorax, the proposed performance limit used an injury criterion known as the Thoracic Trauma Index (dummy) or TTI(d). This injury criterion is based on a combination of peak acceleration values measured in g's on the lower spine and the greater of the acceleration values of the upper and lower ribs of the test dummy. NHTSA requested comments on the appropriateness of a TTI(d) limit ranging from 80 to 115 g's. In addition, the notice requested comments on the appropriateness of limits, ranging from 130 to 190 g's, on the peak acceleration that the pelvis should experience during the impact.

In conjunction with the NPRM to amend Standard No. 214, NHTSA published a separate notice proposing specifications for the side impact test dummy (SID) to be used in the full-scale crash test. 53 FR 2254, January 27, 1988.

Elsewhere in today's *Federal Register*, NHTSA publishes a final rule adopting the dynamic test amendments to Standard No. 214.

This notice establishes specifications for SID. As described in detail later in this notice, the agency conducted a substantial number of tests to develop a test dummy that would be appropriate for use in the upgraded side impact standard. The SID adopted in this notice is based on the Part 572, Subpart B anthropomorphic test device that is used in existing occupant protection safety standards.

Summary of the Final Rule

The specifications for SID consist of a drawing package containing all of the technical details of the dummy parts and dummy assembly, and a set of master patterns for all molded and cast parts of the dummy. Those patterns make possible the rapid reproduction of those parts. In addition, there is a SID user's

manual containing disassembly, inspection, and assembly procedures; external dimensions and weight and a dummy drawing list. These drawings and specifications ensure that the dummies would vary little from each other in their construction. Performance criteria serve as calibration checks and further assure the uniformity of dummy assembly, construction, and instrumentation.

The dummy is instrumented with accelerometers for measurement of accelerations in the chest and pelvis during impacts. The rule specifies the manner and location of installation of the instrumentation to reduce variability in their measurements resulting from differences in location and mounting.

Drawings and specifications for the side impact test dummy are available for examination in the NHTSA Docket Section. Copies of those materials and the SID user's manual can be obtained from the Rowley-Scher Reprographics, Inc., 1111 14th Street, N.W., Washington, D.C. 20005, telephone (202) 628-6667 or 408-8789. In addition, patterns for all cast and molded parts are available on a loan basis from the NHTSA Office of Vehicle Safety Standards.

Description

The SID is identical to the existing Part 572, Subpart B test dummy used in Standard No. 208, with several exceptions. The thorax and pelvis have been redesigned to produce human-like acceleration responses in the lateral direction. Also, the dummy has provision to mount accelerometers for ribs, spine and pelvis; a shock absorber between the ribcage and the spine; and a hinge where the ribs attach to the spine. Further, to keep the design of the SID as simple as possible, the test device does not have articulating arms or shoulders. Instead, the mass of the arms has been incorporated into the mass of the thorax, and urethane foam 'stump' arms have been added for the appropriate biofidelity characteristics. The agency determined early in the development and testing of the SID that the presence of separate physical arms and shoulder structure introduces considerable response variability into the test results. In addition, the use of an articulating arm and shoulder sub-assembly might introduce unnecessary mechanical complications in the construction and assembly of the test dummy.

Biofidelity

In developing SID, NHTSA sought to develop a test dummy that would be an appropriate human surrogate for measuring injury risk in a side impact. The agency considered whether the human injury risk of the particular impact situation could be determined from measurement of responses obtained from SID, and whether those specific responses possess biofidelity of response with human beings. The term "biofidelity" refers to how well a test dummy duplicates the responses of a human being in an impact.

Based on cadaver tests, the agency developed two empirical criteria for measuring injury risk in side impacts: TTI(d) and pelvic acceleration. The bases for these injury criteria are fully discussed in the separate notice adding the dynamic test requirements to Standard No. 214. The agency believes that TTI(d), which is calculated using peak rib and spinal accelerations measured in g's, predicts the probability of differing levels of thoracic injury that a person would experience in a real-world crash. The agency similarly believes that pelvic acceleration predicts the probability of pelvic fracture that a person would experience in a real-world crash. The TTI(d) and pelvic g's injury criteria are based on a large data base containing information on 84 individual cadaver impacts. It should be noted that the two injury criteria do not address all types of injuries in a side impact. For example, they do not address head injuries or some types of abdominal injuries.

In order for SID, or any other test dummy, to be considered an appropriate human surrogate for measuring TTI(d) and pelvic acceleration in the side impact test procedure, the TTI(d) and pelvic acceleration measurements obtained from the dummy must be correlated to those which would be obtained if a human being were subjected to the same impact conditions.

During the development of the SID, NHTSA examined the biofidelity of the SID's thorax (rib/spine) and pelvic acceleration responses in simulated vehicle crash tests.

One primary set of data used by NHTSA in evaluating the biofidelity of the SID was from a series of tests sponsored by the Forschungsvereinigung Automobiltechnik (FAT), an association of German vehicle manufacturers (SAE paper 861877). In those tests, a moving barrier was attached to a sled buck and accelerated down a track so that it impacted the side of a subcompact automobile. A total of 35 three-point belt restrained cadavers and 5 SID test devices were used in this test series. The vehicles containing the cadaver test subjects were struck at speeds ranging from 40-60 kmh (25–37 mph) while the vehicles containing the SID were struck at 50 kmh (31 mph).

In analyzing the results of those tests, the agency compared the cumulative variance of the test dummy responses to the cumulative variance of the cadaver responses. The results, which were discussed in more detail on pages IIIB-8-9 of the Preliminary Regulatory Impact Analysis, indicated that the responses of the upper and lower ribs, the lower spine and the pelvis of the SID correspond well with the responses of the cadavers in similar impacts.

The agency also compared average peak acceleration values of cadavers and the SID in sled tests in which the occupant impacted a padded or rigid wall. These results showed that, for the rigid wall impact condition, the SID thorax and pelvis responses were greater than those of cadavers. This reflects the fact that the SID structure is made of steel and is, naturally, less compliant than the human skeletal structure. However, for the padded wall impact condition, which is more similar to the interior of a car, the SID responses were similar to the cadaver responses.

During the year before the NPRM was issued, NHTSA made a slight revision in the SID thorax design to accommodate a new rib damping material produced by United-McGill. The agency had learned that the damping material used in earlier versions of the SID was being phased out of production. While the proposed SID reflected the new damping material, the tests discussed above used SID dummies with the earlier damping material.

In an addendum to the PRIA, the agency reassessed biofidelity in light of the new damping material. Based on a comparison of peak acceleration values of the thorax in cadavers and the modified SID in 17 mph rigid wall sled tests and 23 mph padded wall sled tests, the agency concluded that the biofidelity of the proposed SID appeared to be better than the earlier SID design as the peak g's were closer to the baseline side impact cadaver data. As discussed in the PRIA, a comparison of the cumulative variance of the test dummy responses to the cumulative variance of the cadaver responses indicated that biofidelity was well within the range of acceptability.

The agency noted in the NPRM that although testing indicates that the SID experiences higher accelerations than a cadaver in a rigid wall impact, such a test environment is not typical of the occupant-to-door interior impacts experienced in side crashes. In tests with a padded structure, which will be more typical of the interior of a door, the SID responses are close to those of cadavers. This is true for both the earlier version of SID and the proposed SID.

In the process of developing the side impact test procedure, NHTSA also compared the force-time loading characteristics of the SID to cadavers in rigid and padded wall impact tests. The purpose of this comparison was to see whether the SID experiences a dynamic impact event in a way which is similar to the one in which a human being experiences such an event. In the NPRM, the agency stated that for rigid wall impacts at 23 mph, the SID thorax and pelvis responded with higher force levels compared to cadavers, but that for padded wall impact conditions, the responses were very similar. NHTSA recognizes, however, that even for the padded wall impacts, the SID experienced a somewhat higher peak force level than cadavers.

As discussed in the PRIA, the United-McGill damping material modifications made prior to issuance of the NPRM increased the force-time response and the impulse response.

NHTSA believes that examination of the impulse responses, which are shown in the FRIA, indicate that SID experiences the same basic dynamic event as a cadaver. For padded wall impacts, which are more similar to the conditions SID will experience in cars, the shape of the curves is generally similar. The duration of the event is similar for SID and cadavers, and the peak force occurs at essentially the same time. The agency's comparison of the acceleration responses of SID and cadavers indicates that the higher peak force experienced by SID does not translate into different acceleration responses. To the extent that the higher peak force is associated with a higher effective chest mass for SID than cadavers, the agency has, as discussed further below, studied the influence of the higher SID chest mass in selecting optimum countermeasures and determined that there is no significant effect.

Numerous commenters argued that SID lacks biofidelity in a number of areas. GM argued that SID is not a credible tool for predicting human response in a side impact because it lacks the following five essential human characteristics: proper chest deflection, proper chest mass, field relevant arm position, credible shoulder load path, and abdominal biofidelity and injury assessment capability.

GM stated that NHTSA's development of SID and a lateral thoracic injury criterion was based on the assumption that the acceleration and force responses of cadavers are sufficient to describe the risk of human thoracic injury in side impacts. That company argued that this is inaccurate, and that deflection is critical to assessing chest injury risk. GM stated that because SID was not designed with correct force versus deflection properties, it is fundamentally invalid as a human simulator.

According to GM, SID cannot reproduce human rib and spine accelerations for the relevant range of real world impact conditions. That commenter argued that the accelerations of the ribs and spine are necessarily dependent upon the compliance of the dummy components which interconnect them. GM argued that without human compliance properties, the acceleration responses cannot be human-like.

GM also argued that the SID thoracic rib mass is not representative of humans. That company stated that the rib mass of SID is about 10 times greater than the rib mass of Hybrid III. According to GM, the thorax of the SID experiences forces during impact that are due primarily to the inertial effects of its overly massive ribs. GM stated that the agency has indicated that the mass of the SID was selected to match the desired TTI values derived for specific test conditions.

That company argued that SID may produce accelerations comparable to the human for one single test condition, but its incorrect inertial properties will cause erroneous responses if the test conditions vary.

Ford commented that there are two major issues regarding SID—its structure, i.e., its stiffness and weight, and its performance, i.e., how human-like is its response. That company argued that the SID thorax is too heavy, too stiff, and does not provide a response which is adequately human-like. Ford argued that the excessive stiffness and greater mass, coupled with the acceleration-based injury criterion TTI(d), have the potential to lead to vehicle design countermeasures (primarily interior door padding) that are too stiff and could actually degrade occupant safety, especially that of the elderly.

Chrysler stated that test dummy biofidelity and Thorasic Trauma Index (TTI) have been the center of controversy since NHTSA's public meeting on side impact protection held in May 1986. (Here, TTI refers to the cadaver responses. It is different from TTI(d), which is the acceleration measurement on the dummy.) That company expressed concern that use of an inappropriate test dummy and injury criterion may result in vehicle designs which meet the requirements, but produce little real world benefits.

BMW argued that SID has inadequate biofidelity, which can lead to erroneous development of injury-reducing measures. According to that commenter, SID reacts more strongly to padding/damping material than do cadavers or real occupants. BMW stated that the rib mass of SID is too high. It argued that the mass of the "missing" arms should not be added to that of the ribs, because this does not represent a real occupant. BMW stated that neither from a biomechanical standpoint, nor from the consideration of a normal seating position, does this appear to be permissible. According to that company, the resulting excessive rib mass results in different inertia forces and effects than would be seen with humans. BMW argued that the inertia forces directly influence the required stiffness of damping materials and, in addition, the dummy kinematics will be influenced by the mass distribution, with additional potential to erroneously influence the development of protective measures.

BMW also expressed concern that force/deflection characteristics were not used in the development of the SID thorax. That company stated that these characteristics have great influence in side impacts, since here a direct interaction of the penetrating structure of the vehicle and the thorax area of the occupant occurs and is responsible for injuries. BMW also argued that peak rib and spine accelerations occur at different times during cadaver testing, but at the same time when SID is tested, which it considers to be another example of the inadequate biofidelity of SID.

A number of commenters cited the results of tests conducted according to procedures developed by the ISO to evaluate the biofidelity of side impact dummies, in support of the argument that SID lacks biofidelity. CCMC stated, based on its testing, that SID does not meet the requirements for 23 responses out of 36. This means that these SID responses differed from the required response by more than 20 percent. Of the remaining 13 responses, seven were exactly in the range prescribed by ISO, and the other six differed from the required ones by less than 20 percent. JAMA stated, based on its testing, that SID failed to meet all of the ISO requirements.

After considering the comments, NHTSA continues to believe that SID has adequate biofidelity. As indicated above, the agency believes that the relevant inquiry is whether SID can provide human-like measurements of the injury criteria specified in the side impact final rule, TTI(d) and pelvic acceleration, under conditions that are representative of real world side impact crashes.

Many commenter criticisms concerning SID biofidelity, including arguments that SID does not meet the ISO corridors for biofidelity, are irrelevant to SID's ability to provide human-like measurements of TTI(d) and pelvic acceleration. The ISO has adopted a very different approach than the agency in evaluating biofidelity. Based on a combination of pendulum, body-drop, and sled tests, it has defined biomechanical response corridors for the thorax, spine, pelvis, head, neck, chest displacement, shoulder and abdomen. In designing SID, NHTSA only sought to ensure biofidelity with respect to TTI(d) and pelvic acceleration. While the agency recognizes that biofidelity in other areas might increase dummy usefulness for purposes of research, it is unnecessary for purposes of a regulatory test device which is intended to measure potential for injury in specific body parts of an occupant under specified impact conditions.

With respect to BMW's assertion that peak rib and spine accelerations occur at different times during cadaver testing than when SID is tested. NHTSA's examination of test data indicates that, for a majority of test conditions, the peak rib and spine accelerations in the SID occurred at about the same time as for cadavers. However, precise agreement of the time of peak acceleration is not important. As long as peak acceleration values are similar, TTI(d) will be similar.

With respect to commenter concerns that the SID thorax is stiffer than that of humans, NHTSA notes that since SID was designed to measure acceleration-based injury criteria in vehicle environments, it was unnecessary for the agency to design SID with biomechanically correct thorax deflection or stiffness based on local area responses such as in pendulum tests.

The agency disagrees with the contention of several commenters that SID is an invalid human

surrogate because it was not designed with correct force versus deflection characteristics. First, as discussed at length in the main side impact notice, NHTSA believes that TTI(d), calculated using peak rib and spinal accelerations, adequately predicts the risk of thoracic injury. Thus, while the agency does not disagree that deflection might be relevant to chest injury risk under certain impact conditions, it does not accept the argument that deflection is critical. Second, NHTSA disagrees with the argument that because the SID thorax is stiffer than that of humans, the SID acceleration responses cannot be human-like. The agency believes that its biofidelity testing, discussed above, demonstrates that SID acceleration responses are close to those of humans, especially in test conditions which are representative of car interiors.

As discussed in the FRIA, analysis using the Department of Transportation side impact sensitivity model indicates that selection of optimum padding is not sensitive to variations in SID stiffness, and that paddings that optimize the SID response will also provide near optimum benefits for human occupants.

With respect to comments concerning the mass of the SID chest, NHTSA notes that, statically, the mass of 65.8 pounds is not significantly different from that of humans. The agency has found that the apparent effective thorax mass (dynamically) is about 18 percent higher than that of a 50th percentile male. As discussed in the FRIA, analysis using modelling indicates that SID's higher apparent effective thorax mass will not affect the selection of optimum padding.

The conclusions that the mass and stiffness of the SID chest will not significantly affect padding selection are supported by recent research comparing SID with two alternative side impact test dummies, EuroSID and BioSID. As part of this research, the agency conducted a series of tests to examine the effect of padding stiffness upon the injury hazard measurements of these dummies when subjected to a given test condition. All three dummies are known to have different thorax mass and thorax stiffness characteristics. Each of the dummies was exposed to a series of 20 mph lateral impacts into a rigid wall which was padded with three-inch thick foam padding of various stiffness. The padding stiffness varied from a very low value representative of a soft foam to nearly as stiff as the rigid wall. All three devices selected essentially the same optimum material, and all three dummies ranked the materials almost identically from softest to hardest. Thus, differences in chest mass and stiffness between the different dummies did not have any significant effect on padding selection.

The agency also notes that in recent tests conducted by MVMA, using Pontiac 6000's with and without padding, the SID and BioSID indicated similar padding effectiveness, i.e., percent reduction in TTI(d). This was in spite of the differences in chest mass and stiffness between the two dummies.

Since differences in thorax mass and stiffness of SID as compared to humans do not affect padding selection, the agency rejects the argument that the use of SID could lead to padding that is so stiff that it would increase injuries to the elderly or any other group of persons. NHTSA also notes that it is obvious that any padding that is added to a car to reduce TTI(d) as measured by SID would clearly be less stiff than the interior car door and, therefore, make a contribution to improving occupant safety for persons of all ages.

NHTSA is not persuaded by GM's concern that while SID may produce accelerations comparable to those for humans for one single type or level of exposure, its incorrect inertial properties will cause erroneous responses if the test conditions vary. As discussed above, SID does experience higher accelerations than a cadaver in a rigid wall impact. NHTSA believes it is important that SID experience human-like responses in the regulated environment. In car interior tests, and in tests with a padded structure, the SID responses are close to those of cadavers. Thus, in the regulated environment, SID testing will result in human-like responses. The SID/BioSID test results cited above also refute GM's claim, since differences in chest mass and stiffness between the two dummies did not lead to different evaluations of padding effectiveness.

The agency disagrees with GM's arguments that SID lacks credible shoulder load path or field relevant arm position. From early development tests, the agency found that an articulating arm and shoulder sub-assembly introduced test variability and mechanical reliability problems. In order to keep the design of SID as simple as possible, the agency designed it without articulating arms or shoulders. Instead, the mass of the arms and shoulders were built into the mass of the thorax, and urethane "stump" arms were added to attain the proper biofidelity characteristics.

As discussed in the FRIA, although the SID does not have an anatomically replicated shoulder structure and arms that can be articulated, there is strong evidence that the "stump" arm design appropriately incorporates the characteristics of the arm and shoulder into the thoracic structure, thus providing a credible shoulder load path. In NHTSA's rigid and padded wall sled tests, the shoulder area of the SID was a load bearing contact point as was the shoulder of the cadaver. There was a strong agreement between the SID and human specimen thorax responses. Also, pendulum tests conducted at 19 mph show reasonable force-time fidelity for the shoulder area of the SID.

GM's argument concerning arm position was based on a study of films indicating left arm position of drivers as they approached a stop sign at an inter-

section and as they started to leave the intersection. That company stated that while the driver used the arm rest 34.4 percent of the time in the open road, the armrest was used only 10.6 percent of the time at intersections. GM argued that because serious side impact injuries occur most frequently in intersection crashes, design improvements of the side interior should focus on the direct loading of the chest and abdomen. Direct loading of the chest and abdomen occurs when the arms are up. GM argued that SID's incorporation of the shoulder and arm into the chest structure replicates an arms down condition, which it believes is inappropriate based on observations of normal driving behavior.

The films utilized by GM were from an Insurance Institute for Highway Safety (IIHS) study concerning shoulder belt use and were taken at all-way stop sign intersections. As discussed in the FRIA, the agency examined the same films and had difficulty in determining arm position in many cases, as well as determining when a vehicle was entering an intersection. The films take a picture of the license plate and then of the occupants to determine belt position. The films generally do not follow the vehicle into the intersection unless a picture was not taken of the front license plate, which made it necessary to take a picture of the rear license plate. NHTSA found that about 40 percent of the drivers' arms were down, which is not significantly different from the number found by GM for drivers approaching an intersection. However, the agency could not determine the drivers' arm position for vehicles entering the intersection with any certainty, contrary to the GM claim.

Given the difficulties in determining the drivers' arm position when entering the intersection, NHTSA does not accept GM's claim that the films indicate that drivers' arms are down only about 10 percent of the time in intersections. In developing the side impact test procedure, NHTSA sought to specify conditions that are representative of a significant number of crashes. NHTSA believes that an arms-down approach is reasonable. As indicated above, the agency found that about 40 percent of the drivers' arms were down in the films cited by GM. Moreover, as discussed in the FRIA, the agency performed an informal survey at a Washington, D.C., intersection of 125 right front seat passengers and found that about 77 percent had their arms down. Finally, even if a driver's arms are up on the steering wheel, the thorax may be partially covered by the upper arm, depending on the length of the driver's arm and the position of the seat in relation to the steering wheel. In addition, the GM argument pertains only to drivers and not passengers. About 25 percent of side impact fatalities and injuries occur to passengers.

Volkswagen argued that shortfalls of SID with respect to biofidelity are demonstrated by full scale crash tests conducted by the Motor Vehicle Manufacturers Association (MVMA) with redundant accelerometers. According to that company, the MVMA data show differences as high as 32 percent in maximum acceleration readings from accelerometers placed next to each other. Volkswagen argued that these differences must be addressed and resolved if the proposed standard is to meet the test of objectivity and reproducibility required of a safety standard.

NHTSA examined the MVMA test data to assess Volkswagen's concern. The agency notes that differences as high as 32 percent occur in certain cars well after the primary peak acceleration has been recorded. For the peak acceleration values which are used in calculating TTI(d), differences between primary and redundant acceleration data are within a normal range of variability. Since the primary and redundant accelerometers are located at slightly different spots, some differences should be expected. The agency also notes that redundant accelerometers are not used in calculating TTI(d).

Durability and Reliability

In the NPRM, NHTSA explained that it had gained considerable experience regarding the SID's durability and reliability from 20 full scale production vehicle tests conducted for the agency by the Transportation Research Center (TRC) of Ohio and from 16 modified 1985 Ford LTD tests, also conducted by TRC of Ohio for MVMA (Society of Automotive Engineers (SAE) paper 871115). These full scale vehicle tests were conducted with the SID unrestrained and simulated typical two vehicle perpendicular impacts, using the MDB at a speed of 33.5 mph. In NHTSA's tests, the relative velocity of the SID and the inner door surface at contact ranged up to 25 mph, based on analysis of the door and SID accelerometer responses.

NHTSA stated in the NPRM that these tests, in combination with rigid wall sled tests, cover what is considered to be the range of impact environments to be encountered by the SID when it is used by vehicle manufacturers in upgrading the side impact performance of their automobiles. The agency stated that at one end of the scale, the rigid wall sled tests conducted at 23 mph are considered to be the most severe of impact environments. At the other end of the scale, the modified 1985 Ford LTD tests conducted by MVMA represent what is considered to be the least severe test condition (with respect to the thorax and pelvis).

While NHTSA's test program covering the first 19 production vehicles was underway, NHTSA identified several changes that would increase the durability of the SID. Those changes, which were incorporated into the dummy and discussed in the NPRM, included: (1) replacing the leather rib hinge of the SID with a rubber impregnated transmission belt to eliminate a

fatigue failure problem, (2) adding a universal joint to the end of the thorax shock absorber to prevent shock absorber piston rod bending as the chest rotated about the spine box, and (3) building plastic hinges into the femurs to stop the breakage of the aluminum knee castings caused by lower leg bending movement during side structure deformation. Since changing the rib hinges could potentially affect the acceleration measurements made with the SID, the agency studied the influence of the new hinge material on thoracic response. The agency determined that only insignificant differences in responses occurred.

The agency has also done considerable work to overcome two other durability problems that developed during the first 19 production vehicle tests. Those two problems involved the delamination of the damping material from the ribs of the SID thorax and the presence of approximately one-half inch of permanent deflection in the rib cage following severe impacts. Delamination of the rib damping material could allow mechanically generated signals to interfere with rib acceleration signals and permanent deflection set within the rib cage could significantly alter the geometry of the SID so that errors could occur in the thoracic responses. NHTSA has studied the influence of both of these failure modes on the production vehicle test results and found that the thoracic responses were not significantly altered by either damping material delamination or the permanent set of the ribs. However, to reduce the possibility of any adverse effects, the agency has developed a new method of attaching the damping material to both inner and outer surfaces of the ribs to reduce delamination. Further, NHTSA has adopted the United-McGill damping material used in the Hybrid III dummy. In addition, the SID drawings package shows the dimensions and configuration of the ribs and the SID user's manual specifies a tolerance for the allowable deviation from the specified rib configuration. Together, these will ensure that the test dummy's ribs do not experience excessive permanent deflection after repeated use.

In the PRIA addendum, NHTSA stated that it had determined that the 23 mph rigid wall condition is too severe for testing durability, with TTI(d)'s in excess of 200, far exceeding the full scale production car range. For the proposed SID, incorporating the United-McGill damping material, a 17 mph rigid wall test was selected for durability testing. This sled test condition corresponds more closely with the upper end of the TTI(d) results that occur in full scale crash tests. In a number of tests discussed in the PRIA addendum, no damping material delamination occurred, and permanent rib bending did not exceed .125 inches.

The agency stated in the NPRM that, overall, it expects the durability of the SID to equal or exceed that of the Hybrid III test dummy. One of the primary reasons for this expectation is that the SID is based on the existing Part 572 Subpart B test dummy, which is durable enough to be used in 70 full scale, unretrained, 30 mph frontal crash tests.

As discussed in the FRIA, with the exception of the ribs and pelvis, which are anticipated to last eight crash tests before needing major replacement parts, NHTSA anticipates that the number of SID full scale side impact crash applications will exceed at least 30 tests without needing major repairs.

NHTSA conducted eight additional full scale tests after issuance of the NPRM. In its testing with the SID, the agency did not experience any problems relating to durability. Further, MVMA and Ford did not note any problems relating to durability in their testing with SID.

Mercedes-Benz commented that a weak-point built into the SID upper thigh, which it assumed to be for protection of the dummy, required repair after each test. It recommended installation of a shear-pin at this connection to prevent damage to other dummy components. That company also suggested that installation of a six-channel force transducer at the thigh be considered in lieu of a shear pin-in order to allow measurement of the movements about this joint.

NHTSA notes that its experience with the SID in testing has been different from that of Mercedes. When an earlier version of SID had a shear pin in its leg, the legs were damaged in tests. The agency revised the design in 1984 and, since then, has not experienced any leg durability problems. Since NHTSA has not specified any leg injury criterion, it has not included any moment measurement in the leg joint.

Reliability

Reliability is closely related to durability in that both affect the ability of the tester to achieve valid and repeatable test results. NHTSA considers reliability to be a measure of the ability of the dummy to achieve valid test results when the dummy is properly calibrated and in good working order. NHTSA considers the term durability, on the other hand, to mean the longer term ability of the dummy to remain in calibration, coupled with the ability of the individual dummy components to resist failure.

The agency explained in the NPRM that, for 20 production vehicle tests, there were a total of 160 primary channels of test data collected. In those tests, there were only 3 cases of lost data used for TTI(d) computations and 5 cases of data missing in pelvis acceleration readings. These test results indicated an overall SID data acquisition reliability of 93 percent for TTI(d) and a reliability of 88 percent with respect to pelvis acceleration. The reliability of SID in the additional eight tests conducted after issuance of the NPRM remained consistent.

In reviewing the results of the NHTSA and MVMA full scale tests, the agency concludes that SID is just as reliable as the Hybrid III dummy or the Part 572, Subpart B dummy.

Repeatability and Reproducibility

As discussed in the NPRM, NHTSA has carefully studied the repeatability and reproducibility of the SID using two methods. The control of the variation of dummy responses for the same device (called repeatability) and among different SID devices (called reproducibility) has been a primary goal of the agency during development of the side impact test dummy.

The agency has used a number of methods to evaluate the repeatability and reproducibility of the SID. In work done for the agency by Calspan, the agency used a statistically based approach called the Normalized Integrated Squared Error Method in which the amplitude, phase, and shape of the deviations of each individual acceleration-time response curve of the SID is compared to the mean value for all the curves (SAE Paper 831624). The second method used by the agency involved comparing the coefficient of variation for a sample of pendulum data and 23 mph sled test data (Safety Research Laboratory (SRL)–102).

In its study, Calspan established, based on its engineering judgment, a 6 percent range of acceptable variance for repeatability and an 8 percent range of acceptability for reproducibility for the phase, amplitude, and shape of the response acceleration-time curves (SAE Paper 831624). Calspan evaluated a group of six SIDs in a series of 14 and 20 fps pendulum impacts. The results obtained in those tests are representative of the SID test devices used in the early development phases of the agency's side impact program. The results showed that the repeatability and reproducibility of the test dummies were well within the two ranges of variability.

NHTSA's Vehicle Research and Test Center conducted a series of 14 fps pendulum impacts and 23 mph sled tests with some of the SID dummies being used in the 19 full scale production vehicle test program. The coefficients of variance for the 14 fps pendulum qualification tests conducted on two of the test dummies ranged from 4.8 percent to 6.9 percent for one test dummy and 3.8 percent to 4.1 percent for the other, well within the range of acceptability.

The agency also examined the repeatability and reproducibility of the test dummies in 23 mph sled tests. Those tests showed that, for the thorax, spine, and pelvis responses, the repeatability is very high, with coefficient of variation values of 2.9 percent maximum for the ribs, 7.7 percent for the lower spine and 1.7 percent for the pelvis. With respect to reproducibility, the coefficients of variance values for the same three responses among the three SIDs tested were maximums of 2.4, 6.2, and 2.5 percent, respectively. By comparison, the Hybrid III repeatability coefficient of variation values ranged from 2.7 percent to 6.2 percent while reproducibility coefficient of variation values varied from 3.4 percent to 5.2 percent.

In the PRIA addendum, the agency presented repeatability/reproducibility data, derived from sled tests, for SID dummies incorporating the United-McGill damping material. The data indicated that the repeatability of all the proposed SID responses was as good, if not better, than the earlier SID. Except for the pelvis of the proposed SID at 17 mph rigid wall, the reproducibility of the proposed SID appeared to be about the same as the earlier SID. While pelvic reproducibility was not as good for the 17 mph rigid wall condition, with a coefficient of variation of 13 percent, pelvic reproducibility was excellent for the 23 mph padded wall condition, with a coefficient of variation of only 2 percent. Since the agency believes that a padded wall condition is more representative of a car interior, the agency considered the overall reproducibility of the pelvis to be acceptable.

Several commenters argued, notwithstanding the analysis presented in the NPRM and PRIA, that SID lacks repeatability and reproducibility. JAMA argued that its data from five impactor tests indicated that SID lacks repeatability. According to that organization, the coefficient of variation for the SID upper spine acceleration was 10.1 percent. JAMA also argued that SID lacks reproducibility, even for dummies produced by the same manufacturer. According to that commenter, data from five impactor tests conducted on a pair of SID dummies resulted in a coefficient of variation of 17.7 percent for lower rib acceleration.

Nissan commented that reproducibility even among dummies from the same manufacturer proved unacceptably poor in its tests, which it said were carried out in accordance with the proposed NHTSA procedures. That company stated that it is not satisfied that the data presented by NHTSA has laid to rest the issue of dummy reproducibility, and argued that further testing by the agency is warranted.

CCMC commented that wide calibration tolerances for SID, such as the proposed tolerance of $\pm$ 20 percent for the pelvis acceleration, are too great to ensure reproducible test results. That commenter argued that under otherwise identical test conditions, widely deviating results, with a range of 40 g to 60 g, can be expected with dummies which perform at the upper or lower limit.

Volkswagen expressed similar concerns to those of CCMC and recommended that the regulation specify that the existence of a manufacturer's development or certification test data at a specific dummy calibration require evidence of conflicting data at the same calibration before a noncompliance investigation can

begin. Volkswagen stated that "another result of the physical limitations of the material used to construct the SID is the spread of certain calibration corridors. Wide calibration corridors may provide unintended and unnecessary risks of non-compliance for manufacturers who performed good faith tests indicating compliance with the standard. If certification testing and compliance testing are coincidently conducted with dummies which fall into opposite ends of the allowable calibration spectrum, conflicting results are likely to occur. For example, the calibration tolerances of ± 20 percent for the pelvis accelerations are too great to assure reproducible test results. Under otherwise identical test conditions, widely deviating results with a range of 40–60 g's are expected with dummies which perform at the upper or lower limit. This tolerance is not acceptable for a regulatory compliance test device."

Volvo also expressed concern about the proposed calibration tolerance bands. That company noted that the agency proposed tolerance bands of ± 11 percent for rib acceleration, ± 20 percent for pelvis acceleration, and ± 19 percent for lower spinal acceleration. Volvo stated that for most other dummies used in development and compliance testing, including three Part 572 dummies, the accepted calibration tolerance bands are approximately ± 10 percent for measurements from which injury criteria are calculated. That commenter stated that it is not acceptable that tolerance bands as wide as ± 20 percent exist on measurements used in the calculation of TTI and pelvic acceleration.

Toyota argued, based on calibration tests of five SID dummies produced by two manufacturers, that repeatability was poor even for one dummy, and that there were marked differences between individual dummies made by the same manufacturer as well as differences between the two manufacturers' dummies. That company also argued that the proposed calibration tolerances are so large as to make objective testing impossible. Toyota argued that if it is too difficult to narrow the measurement range, it will be necessary to have the means to compensate for the test results by employing the calibration results.

Toyota also stated that it believes that if there is to be satisfactory repeatability in full scale testing, the differences in the impact response characteristics of the individual dummy parts must be minimized. Toyota stated that it discovered great differences in the force-crush characteristics of the arm foam of the five SID dummies, and argued that the agency should set clear SID component performance parameters for critical SID components, i.e., arm foam, ribs, rib wrap, etc.

After considering the comments, NHTSA continues to believe that SID has adequate repeatability and reproducibility. The agency notes that commenter concerns about SID repeatability/reproducibility were for the most part based either on the results of calibration tests conducted according to the proposal, or on the proposed calibration tolerance bands.

In addressing those comments, the agency believes it appropriate to first discuss the purpose of the proposed calibration tests. Before a test dummy can be used in a vehicle crash test, it must be examined to determine whether it conforms to all of the specifications set out in the blueprints for the dummy. In addition, the dummy must be carefully examined to make sure that it has been correctly assembled. Finally, the test dummy must pass a series of calibration tests, which are also referred to as qualification tests. The purpose of a qualification test is to measure the performance of the test dummy in a well-controlled laboratory impact test to determine whether the test dummy's responses are within specifications and thus the test dummy will provide objective results.

The agency proposed two calibration tests for the side impact test dummy. The first is a 14 fps pendulum impact to the center of the side of the thorax on the side to be struck. The purpose of that test is to measure the response of the upper and lower rib and the lower spine. The proposed qualification limits in those tests were that the upper rib must experience an acceleration that is not less than 37 g's and not more than 46 g's, the lower rib must experience between 37 and 46 g's and the lower spine 15 to 22 g's. The other test involves a 14 fps pendulum impact to the pelvis to measure the pelvic responses. The proposed limits were that the acceleration measured in the pelvis shall be not less than 40 g's and not more than 60 g's. In addition, the acceleration-time curve must be unimodal and lie at or above the + 20 g level for not less than 3 milliseconds and not more than 7 milliseconds.

While NHTSA has considered various pendulum tests, including calibration tests, in evaluating repeatability/reproducibility, it does not consider them to be the most reliable tests for such evaluation. The energy imparted into a dummy in calibration testing is much lower than the energy that the dummy will receive in full scale testing. The dummy is a device made up of many mechanical components and built in frictions which will vary from dummy to dummy. This will affect how the dummies respond in the low energy calibration tests to a far greater degree than the high energy of full scale testing. This produces higher variance in low speed calibration tests than will be experienced in higher severity full scale tests. This is illustrated by the fact that in a repeatability test series conducted by NHTSA under its New Car Assessment Program (for frontal protection, using a different dummy), differences in dummy calibration results had "no . . . correlation to dummy response results in the vehicle crash event." SAE paper 840201, February 1984. NHTSA believes that the proposed calibration tests for SID, with their present spread, ensure that the dummies being delivered are built alike and that they will give like responses during full scale tests.

The agency believes that the best tests for evaluating dummy repeatability are sled tests at a speed equivalent to full scale test inner door impact speeds. Sled tests can be better than vehicle tests for this purpose because sled tests eliminate full scale vehicle test variability. The results of such a series of sled tests, cited above, indicated that SID has good repeatability/reproducibility.

NHTSA also notes that full scale side impact test data, discussed in the main side impact notice indicate good repeatability/reproducibility. Since dummy repeatability/reproducibility is reflected in full scale test results, the full scale data support the conclusion that SID has good repeatability/reproducibility.

Since sled test data and full scale crash test data indicate that SID has good repeatability/reproducibility, NHTSA concludes that the inherently greater variability found in calibration tests is not a problem. The agency similarly concludes that the proposed calibration tolerance bands will not result in poor repeatability/reproducibility.

With respect to Toyota's claim that additional component performance parameters should be established for critical SID components, NHTSA notes that extensive specifications have already been provided for the SID, as well as qualification tests. The agency does not believe that company has demonstrated that additional specifications are needed to ensure repeatability/reproducibility in the side impact full scale test.

Qualification Tests

NHTSA notes that the proposed qualification tests are discussed at some length in the preceding section on repeatability/reproducibility, and that discussion will not be repeated.

NHTSA explained in the NPRM that, with one exception, both proposed qualification tests utilize readily available compliance test equipment instrumentation and procedures that are already used in qualification testing of other test dummies. The one exception is the use of a Finite Impulse Response (FIR) filter to process the acceleration data measured in the test. The agency proposed the use of the FIR filtering methodology to process acceleration signals, rather than the standard SAE practice, since the FIR filtering technique was used with the cadaver impact data and with the sled and vehicle test data. Some additional steps are needed in handling the thorax response data. A special Fortran software package, called FIR100, developed by the agency is necessary to process the data (See Docket No. 79-04-N02-018). Based on its experience, NHTSA does not anticipate that crash data processing would be significantly affected by requiring the use of the FIR filter by the manufacturers and compliance test laboratories.

The agency noted that the two specified qualification tests for the SID require less labor and are less expensive compared to the tests used with the Part 572 Subpart B and and the Hybrid III in a Standard No. 208 compliance test. The Part 572, Subpart B test dummy must pass 10 qualification tests and the Hybrid III must pass 9 tests. Although the SID has significantly fewer qualification requirements, hence lower labor costs per test, some of that benefit may be offset, for example, in replacing ribs or sections of ribs if the qualification corridors are not met. The SID chest appears to be more complicated than the Hybrid III thorax and could be more labor intensive if repairs are needed.

As discussed above, a number of commenters argued that the proposed calibration tolerances for SID are too wide to ensure repeatable test results. The concerns about repeatability are addressed above. NHTSA is not narrowing the calibration limits, since to do so would make it more difficult to calibrate the dummies. The calibration limits are based on consideration of a large amount of test data.

Toyota stated that it believes the 4.27 m/s speed in the calibration test, compared to the 10 to 12 m/s secondary collision speed in the full scale test, is too low. It argued that the speed must be raised if dummy performance is to be assured in full scale testing.

NHTSA notes that the calibration tests are not the primary means for ensuring repeatability/reproducibility in full scale testing. The primary means involve detailed specification of all dummy parts. The calibration tests serve as a final check on uniformity of construction, assembly and instrumentation. The tests also help indicate if a dummy has been damaged in a prior test. NHTSA believes that the proposed speeds are adequate for these purposes. If higher speeds were selected, the calibration tests themselves could potentially result in damage to the dummy, because of the concentrated loading in such tests.

Toyota stated that it conducted calibration tests on five SID dummies, three produced by ARL and two produced by Humanoid, and was not able to calibrate them. It stated that this problem can be attributed to variations in dummy manufacture, and expressed concern that it and other auto manufacturers could be forced to spend time and money on dummy adjustment, procurement of components and retesting before any SID could be used in actual certification testing.

Nissan stated that it conducted calibration tests using four assemblies of SID, and none of the assemblies satisfied the proposed calibration requirements.

When a new SID dummy is purchased, the purchaser should check it carefully to ensure that it meets the specifications established by NHTSA. Also, adjustments to the dummy may be necessary to bring it within the specified calibration bands.

The agency is aware that some SID dummies have been delivered with materials that do not meet specifications. For example, inspections of dummies by NHTSA staff have revealed such things as rib hinges mounted with the wrong orientation, rib damping material extending too far along the rib at the spine end, and rib wrap and arm parts made from the wrong foam. NHTSA considers it unfortunate that these types of manufacturing deficiencies sometimes occur. Some of the deficiencies may be attributable to start-up problems in producing a new dummy, and are not different from the problems experienced with other new dummies. However, dummy purchasers can resolve these sorts of problems by careful inspection of the dummies and by working with the dummy manufacturer. By taking these actions, and making appropriate dummy adjustments, users can bring their dummies within the specified calibration bands.

Temperature Sensitivity

As discussed in the NPRM, the agency developed the side impact test procedure, and the application of the SID dummy, around a 66° F to 78° F interior occupant temperature range, the same as required for the Part 572, Subpart B dummy used in Standard No. 208 tests. The similarity in construction of the chests of the SID, Part 572, Subpart B, and Hybrid III have made the agency particularly aware of response variations due to changes in temperature and of the importance of a practicable test temperature range for side impact compliance tests.

The test procedure specifies that the SID be placed in a controlled temperature environment for at least four hours within a 66–78° F temperature range prior to each crash test. In addition, the SID is to be maintained within this temperature range during the crash test. NHTSA has found in its crash testing of production vehicles that it is possible to maintain the temperature of the test dummy within the required range prior to the test by using a portable heating or air conditioning unit, as necessary. In cases of extremely low or high temperatures, the agency has found that the use of a portable garage can provide a controlled ambient temperature of approximately 72° F.

At the time of the NPRM, the agency did not have temperature sensitivity data. Since that time, the agency has conducted a test series and the temperature sensitivity of the SID appears to be superior to that of Hybrid III and comparable to the Part 572 Subpart B dummy. The FRIA presents data comparing SID sensitivity with the Part 572, Subpart B and the Hybrid III dummy.

FIR Filter

The FIR filter is used in the side impact test procedure to select rib, spine and pelvis responses from acceleration signals.

Ford commented that FIR filter differences need to be resolved. That company stated that, for use in compliance testing, the FIR filter procedure must be specified in detail. Ford stated that, in particular, the agency must specify the type of SAE Class 180 prefilter that must be used (i.e., Butterworth, Chebyshev, etc.), how bias is handled, subsample rate and the digital software coding. That company stated that it believes the present FIR filter specification could lead to significant differences in test results between different testing laboratories.

In light of Ford's concerns about possible variability, NHTSA is specifying use of its own computer program called FIR100. See Docket No. 79-04, Notice 2, item 18.

Alternative Dummies

As part of its side impact rulemaking, NHTSA has considered two alternative dummies to SID, EuroSID and BioSID. As discussed in the NPRM, the EuroSID dummy was developed by a group of European research organizations under the auspices of the European Experimental Vehicles Committee (EEVC). Subsequent to issuance of the NPRM, GM developed the BioSID dummy, in cooperation with the Society of Automotive Engineers.

NHTSA tested a prototype or pre-production EuroSID dummy and concluded that it was well designed and durable for the conditions tested, possessed "good" repeatability, and could be used to assess potential countermeaures. The biofidelity was equivalent to the SID in both pendulum and sled tests and was essentially equivalent to the SID in terms of acceleration responses, wall loading, and TTI(d) computation.

One of the advantages of the EuroSID is that it measures chest deflection and velocity and can therefore be used to measure Viscous Injury Criterion (V*C) as well as TTI(d). (A discussion of alternative thoracic injury criteria, including V*C, is provided in the main side impact notice.)

One of the problems discovered in NHTSA's EuroSID sled tests was that the ribs were bottoming out, which may have invalidated the V*C measurements being made. This condition was characterized by a flat spot on the displacement-time history curve, while the acceleration-time history curve showed an increase with time until the peak g was reached. Although considerable attempts were made to correlate V*C and TTI(d), the deflection data collected continued to be questionable. The EuroSID specifications also have changed since NHTSA tested the prototype. In view of this, NHTSA returned one of two EuroSIDs so that it could be retrofitted in accordance with its latest specifications.

In 1988, MVMA conducted a full scale crash test series using the prototype EuroSID dummy in a variety of test configurations: (1) NHTSA test procedure and the EuroSID dummy, (2) NHTSA test procedure with

EEVC barrier face and the EuroSID dummy, and (3) the European test procedure. In the MVMA data set, the same rib deflection bottoming phenomenon was observed, calling into question the validity of the V*C measures that were made. TTI(d) measurements were also taken in that test program. See Docket No. 88-06-N01-089.

NHTSA recently conducted a series of 20 mph sled tests comparing the ability of the retrofitted EuroSID, SID and BioSID to discriminate between padding types using the TTI(d). The results indicate that as an acceleration based tool, the EuroSID is comparable to the other side impact dummies.

The BioSID dummy was designed to conform to the ISO biofidelity corridors and can measure rib deflection for the computation of V*C. NHTSA purchased two pre-production BioSIDs, and as discussed above, has conducted a 20 mph sled test series to compare the ability of BioSID and the other two dummies to discriminate between different types of padding material using the TTI(d). As discussed in the FRIA, BioSID's performance was equivalent to the SID and the EuroSID in selecting the optimum padding using TTI(d) as the injury criterion. NHTSA has initiated an independent test program to further study the BioSID and evaluate its suitability as an alternative side impact dummy (e.g., sled tests and full scale crash tests). In addition, MVMA has recently completed a full scale crash test program at the GM Proving Grounds using the BioSID and the SID to establish full scale crash comparability between the two test devices.

NHTSA recognizes that BioSID and EuroSID have potential advantages over SID to the extent that they can measure V*C or other compression-based injury criteria in addition to TTI(d). Specification of EuroSID as an alternate test device could also promote international harmonization.

However, the agency does not believe that these potential advantages should lead to a delay in this rulemaking for further consideration of alternate dummies. NHTSA believes that TTI(d) is a reliable predictor for thoracic injury and that SID is fully developed and validated. Since SID is ready now, and a final rule specifying SID can result in significant safety benefits, the agency believes it is appropriate to now go to a final rule using the SID.

Assuming that NHTSA's review of the BioSID is satisfactory, the agency intends to propose the use of the BioSID as an alternate test device. Europe is continuing to work on the EuroSID. If the agency obtains data showing that EuroSID compares satisfactorily with SID, it may also propose that dummy as an alternate test device.

Drawing Package

As indicated earlier in this notice, the specifications for SID consist of a drawing package containing all of the technical details of the dummy parts and dummy assembly, and a set of master patterns for all molded and cast parts of the dummy. There is also a SID user's manual containing disassembly, inspection, and assembly procedures; external dimensions and weight; and a dummy drawing list. The drawings and specifications are provided to ensure that the dummies will not significantly vary in their construction.

41 PART 572—[AMENDED]

In consideration of the foregoing, 49 CFR Part 572 is amended as follows:

A new Subpart F, consisting of sections 572.40 through 572.44, is added to read as follows:

Subpart F
Side Impact Dummy 50th Percentile Male.

Sec.

Subpart F—Side Impact Dummy 50th Percentile Male.

§ 572.40 Incorporated materials.

(a) The drawings, specifications, and computer program referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. These materials are thereby made part of this regulation. The Director of the *Federal Register* has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the *Federal Register* and specified in the regulation are incorporated. A notice of any change will be published in the *Federal Register*. As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the *Code of Federal Regulations*.

(b) The materials incorporated in this part by reference are available for examination in the general reference section of Docket 79-04, Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, S.W., Washington, D.C. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1111 14th Street, N W., Washington, D.C. 20005, telephone (202) 628-6667 or 408-8789.

§ 572.41 General description.

(a) The dummy consists of component parts and component assemblies (SA-SID-M001A) which are described in approximately 250 drawings and specifi-

cations that are set forth in Part 572.5(a) of this Chapter with the following changes and additions which are described in approximately 85 drawings and specifications:

(1) The head assembly consists of the assembly specified in Subpart B (§ 572.6(a)) and conforms to each of the drawings subtended under drawing SA 150 M 010 and drawings specified in SA SID M 010 of this subpart.

(2) The neck assembly consists of the assembly specified in Subpart B (§ 572.7(a)) and conforms to each of the drawings subtended under drawing SA 150 M 020 and drawings shown in SA-SID-M010.

(3) The thorax assembly consists of the assembly shown as number SID-053 and conforms to each applicable drawing subtended by number SA SID M 030.

(4) The lumbar spine consists of the assembly specified in Subpart B (§ 572.9(a)) and conforms to drawing SA 150 M 050 and drawings subtended by SA SID M 050 specified by this part.

(5) The abdomen and pelvis consist of the assembly specified in Subpart B (§ 572.9) and conform to the drawings subtended by SA 150 M 060 and drawings subtended by SA SID M 060 specified by this Subpart.

(6) The lower limbs consist of the assemblies specified in Subpart B (§ 572.10) shown as SA 150 M 080 and SA 150 M 081 in Figure 1 and SA SID M 080 and SA SID M 081 and conform to the drawings subtended by those numbers.

(b) The structural properties of the dummy are such that the dummy conforms to the requirements of this subpart in every respect both before and after being used in vehicle tests specified in Standard No. 214 (Part 571.214 of this Chapter).

(c) Disassembly, inspection, and assembly procedures; external dimensions and weight; and a dummy drawing list are set forth in the Side Impact Dummy (SID) User's Manual, dated July 1990.

§ 572.42 Thorax.

(a) When the thorax of a completely assembled dummy (SA-SID-M001A), appropriately assembled for right or left side impact, is impacted by a test probe conforming to § 572.44(a) at 14 fps in accordance with paragraph (b) of this section, the peak accelerations at the location of the accelerometers mounted on the thorax in accordance with § 572.44(b) shall be:

1. for the accelerometer at the top of the Rib Bar on the struck side (LUR or RUR) not less than 37 g's and not more than 46 g's.

2. for the accelerometer at the bottom of the Rib Bar on the struck side (LLR or RLR) not less than 37 g's and not more than 46 g's.

3. for the lower thoracic spine (T12) not less than 15 g's and not more than 22 g's.

(b) *Test Procedure* (1) Adjust the dummy legs as specified in § 572.44(f). Seat the dummy on a seating surface as specified in § 572.44(h) with the limbs extended horizontally forward.

(2) Place the longitudinal centerline of the test probe at the lateral side of the chest at the intersection of the centerlines of the third rib and the Rib Bar on the desired side of impact. This is the left side if the dummy is to be used on the driver's side of the vehicle and the right side if the dummy is to be used on the passenger side of the vehicle. The probe's centerline is perpendicular to thorax's midsagittal plane.

(3) Align the test probe so that its longitudinal centerline coincides with the line formed by the intersection of the transverse and frontal planes perpendicular to the chest's midsagittal plane passing through the designated impact point.

(4) Position the dummy as specified in § 572.44(h), so that the thorax's midsagittal plane and tangential plane to the Hinge Mounting Block (Drawing SID-034) are vertical.

(5) Impact the thorax with the test probe so that at the moment of impact at the designated impact point, the probe's longitudinal centerline falls within 2 degrees of a horizontal line perpendicular to the dummy's midsagittal plane and passing through the designated impact point.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical or rotational movement.

(7) Allow a time period of at least 20 minutes between successive tests of the chest.

§ 572.43 Lumbar spine and pelvis.

(a) When the pelvis of a fully assembled dummy (SA-SID-M001A) is impacted laterally by a test probe conforming to § 572.44(a) at 14 fps in accordance with paragraph (b) of this section, the peak acceleration at the location of the accelerometer mounted in the pelvis cavity in accordance with §572.44(c) shall be not less than 40 g and not more than 60 g. The acceleration-time curve for the test shall be unimodal and shall lie at or above the +20g level for an interval not less than 3 milliseconds and not more than 7 milliseconds.

(b) *Test Procedure.* (1) Adjust the dummy legs as specified in § 572.44(f). Seat the dummy on a seating surface as specified in § 572.44(h) with the limbs extended horizontally forward.

(2) Place the longitudinal centerline of the test probe at the lateral side of the pelvis at a point 3.9 inches vertical from the seating surface and 4.8 inches ventral to a transverse vertical plane which is tangent to the back of the dummy's buttocks.

(3) Align the test probe so that at impact its longitudinal centerline coincides with the line formed by intersection of the horizontal and vertical planes perpendicular to the midsagittal plane passing through the designated impact point.

(4) Adjust the dummy so that its midsagittal plane is vertical and the rear surfaces of the thorax and buttocks are tangent to a transverse vertical plane.

(5) Impact the pelvis with the test probe so that at the moment of impact the probe's longitudinal centerline falls within 2 degrees of the line specified in (3) above.

(6) Guide the test probe during impact so that it moves with no significant lateral, vertical or rotational movement.

(7) Allow a time period of at least 2 hours between successive tests of the pelvis.

§ 572.44 Instrumentation and test conditions.

(a) The test probe used for lateral thoracic and pelvis impact tests is a 6 inch diameter cylinder that weighs 51.5 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid and has an edge radius of 0.5 inches.

(b) Three accelerometers are mounted in the thorax for measurement of lateral accelerations with each accelerometer's sensitive axis aligned to be closely perpendicular to the thorax's midsagittal plane. The accelerometers are mounted in the following locations:

(1) One accelerometer is mounted on the Thorax to Lumbar Adaptor (SID-005) by means of a T12 Accelerometer Mounting Platform (SID-009) and T12 Accelerometer Mount (ID-038) with its seismic mass center at any distance up to 0.4 inches from a surface point on the Thorax to Lumbar Adaptor where two perpendicular planes aligned with the adaptor's vertical and horizontal center lines intersect.

(2) Two accelerometers are mounted, one on the top and the other at the bottom part of the Rib Bar (SID-024) on the struck side. Their seismic mass centers are at any distance up to .4 inches from a point on the Rib Bar surface located on its longitudinal center line .75 inches from the top for the top accelerometer and .75 inches from the bottom, for the bottom accelerometer.

(c) One accelerometer is mounted in the pelvis for measurement of the lateral acceleration with its sensitive axis perpendicular to the pelvic midsagittal plane. The accelerometer is mounted on the rear wall of the instrument cavity (Drawing SID-087), with its seismic mass center located up to 0.30 inches from the point of intersection of the cover plate centerlines and 0.34 inches rearward of the rear wall of the instrument cavity.

(d) Instrumention and sensors used must conform to the SAE J-211 (1980) recommended practice requirements. The outputs of the accelerometers installed in the dummy are then processed with the software for the Finite Impulse Response (FIR) filter (FIR 100 software). The FORTRAN program for this FIR 100 software (FIR100 Filter Program, Version 1.0, July 16, 1990) is incorporated by reference in this Part. The data are processed in the following manner:

(1) Analog data recorded in accordance with SAE J-211 (1980) recommended practice channel class 1000 specification;

(2) Filter the data with a 300 Hz, SAE Class 180 filter;

(3) Subsample the data to a 1600 Hz sampling rate;

(4) Remove the bias from the subsampled data, and

(5) Filter the data with the FIR100 Filter Program (Version 1.0, July 16, 1990), which has the following characteristics—

(A) Passband frequency, 100 Hz.

(B) Stopband frequency, 189 Hz.

(C) Stopband gain, -50 db.

(D) Passband ripple, 0.0225 db.

(e) The mountings for the spine, rib and pelvis accelerometers shall have no resonance frequency within a range of 3 times the frequency range of the applicable channel class.

(f) Limb joints of the test dummy are set at the force between 1-2 g's, which just supports the limbs-weight when the limbs are extended horizontally forward. The force required to move a limb segment does not exceed 2 g's throughout the range of limb motion.

(g) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.

(h) For the performance of tests specified in §§ 572.42 and 572.43, the dummy is positioned as follows:

(1) The dummy is placed on a flat, rigid, clean, dry, horizontal smooth aluminum surface whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface. The dummy's torso is positioned to meet the requirements of § 572.42 and § 572.43. The seating surface is without the back support and the test dummy is positioned so that the dummy's midsagittal plane is vertical and centered on the seat surface.

(2) The legs are positioned so that their centerlines are in planes parallel to the midsagittal plane.

(3) Performance pre-tests of the assembled dummy are separated in time by a period of not less than 20 minutes unless otherwise specified.

(4) Surfaces of the dummy components are not painted except as specified in this part or in drawings subtended by this part.

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Jerry Ralph Curry
Administrator

55 F.R. 45757
October 30, 1990

with the seismic mass center located 0.2 inches superior to, 0.5 inches to the right of, and 0.1 inches ventral to the thorax accelerometer reference points.

(iv) All seismic mass centers shall be positioned within ± 0.05 inches of the specified locations.

(2) The sensing elements of the Type A triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and midsagittal planes, with the seismic mass center located from 0.2 inches left to 0.28 inches right, from 0.5 to 0.15 inches inferior to, and from 0.15 to 0.25 inches ventral of the thorax accelerometer reference point.

(ii) Align the second sensitive axis so that it is in the horizontal transverse plane and perpendicular to the midsagittal plane, with the seismic mass center located from 0.06 inches left to 0.2 inches right of, from 0.1 inches inferior to 0.24 inches superior, and 0.15 to 0.25 inches ventral to the thorax accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.15 to 0.25 inches superior to, 0.28 to 0.5 inches to the right of, and from 0.1 inches ventral to 0.19 inches dorsal to the thorax accelerometer reference point. **(55 F.R. 30465—July 26, 1990. Effective: August 27, 1990)]**

(d) The outputs of accelerometers installed in the dummy, and of test apparatus specified by this part, are recorded in individual data channels that conform to the requirements of SAE Recommended Practice J211a, December 1971, with channel classes as follows:

(1) Head acceleration—Class 1,000.

(2) Pendulum acceleration—Class 60.

(3) Thorax acceleration—Class 180.

(e) The mountings for accelerometers have no resonance frequency less than 3 times the cut-off frequency of the applicable channel class.

(f) Limb joints are set at the force between 1–2g, which just supports the limbs' weight when the limbs are extended horizontally forward. The force required to move a limb segment does not exceeed 2g throughout the range of limb motion.

(g) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.

(h) For the performance tests specified §§ 572.16, 572.18, and 572.19, the dummy is positioned in accordance with Figures 16, 17, and 18 as follows:

(1) The dummy is placed on a flat, rigid, clean, dry, horizontal surface of teflon sheeting with a smoothness of 40 microinches and whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface. For head tests, the seat has a vertical back support whose top is 12.4 ± 0.2 inches above the seating surface. The rear surfaces of the dummy's shoulders and buttocks are touching the back support as shown in Figure 16. For thorax and lumbar spine tests, the seating surface is without the back support as shown in Figures 17 and 18 respectively.

(2) The shoulder yokes are adjusted so that they are at the midpoint of their anterior-posterior travel with their upper surfaces horizontal.

(3) The dummy is adjusted for head impact and lumbar flexion tests so that the rear surfaces of the shoulders and buttocks are tangent to a transverse vertical plane.

(4) The arms and legs are positioned so that their centerlines are in planes parallel to the midsagittal plane.

(i) The dummy's dimensions are specified in drawings No. SA 103C 002, sheets 22 through 26.

(j) Performance tests of the same component, segment, assembly or fully assembled dummy are separated in time by a period of not less than 20 minutes unless otherwise specified.

(k) Surfaces of the dummy components are not painted except as specified in this part or in drawings subtended by this part.

Subpart D—Six-Month-Old Infant

§ 572.25 General Description.

(a) The infant dummy is specified in its entirety by means of 5 drawings (No. SA 1001) and a construction manual, dated July 2, 1974, which describe in detail the materials and the procedures involved in the manufacturing of this dummy.

(b) The drawings, specifications, and construction manual referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. These materials are thereby made part of this regulation. The Director of the Federal Register has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the Federal Register and specifed in the regulation are incorporated. A notice of any change will be published in the *Federal Register*. As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the *Code of Federal Regulations*.

(c) The materials incorporated by reference are available for examination in Docket 78-09, Room 5109, Docket Section, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1111 14th Street, N.W., Washington, D.C. 20005, ((202) 628-6667 or 408-8789). The materials are also on file in the reference library of the Office of the Federal Register, National Archives and Records Administration , Washington, D.C.

(d) The structural properties of the dummy are such that the dummy conforms to this part in every respect both before and after being used in vehicle tests specified in Standard No. 213 of this chapter (§ 571.213).

Subpart E—Hybrid III Test Dummy

Source: 51 FR 26701, July 25, 1986, unless otherwise noted.

Effective Date Note and Optional Compliance Provisions: At 51 FR 26701, July 25, 1986, Subpart E—Hybrid III Test Dummy was added, effective October 23, 1986. As of that date, manufacturers have the option of using either the Part 572 test dummy (Subpart B) or the Hybrid III test dummy until August 31, 1991. As of September 1, 1991, the Hybrid III will replace the Part 572 test dummy (Subpart B) and be used as the exclusive means of determining a vehicle's conformance with the performance requirements of Standard No. 208 (§ 571.208).

§ 572.30 Incorporated Materials.

(a) The drawings and specifications referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. The Director of the Federal Register has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the Federal Register and specified in the regulation are incorporated. A notice of any change will be published in the *Federal Register*. As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the *Code of Federal Regulations*.

(b) The materials incorporated in this part by reference are available for examination in the general reference section of Docket 79-04, Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1216 K Street, N.W., Washington, D.C. 20005, ((202) 628-6667). The drawings and specifications are also on file in the reference library of the Office of the Federal Register, National Archives and Records Administration, Washington, D.C.

§ 572.31 General Description.

(a) The Hybrid III 50th percentile size dummy consists of components and assemblies specified in the Anthropomorphic Test Dummy drswings and specifications package which consists of the following six items:

(1) The Anthropomorphic Test Dummy Parts List, dated [December 15, 1987], and containing 13 pages, and Parts list Index, dated [December 15, 1987], containing [8] pages,

(2) A listing of Optional Hybrid III Dummy Transducers, dated April 22, 1986, contain 4 pages

(3) A General Motors Drawing package identified by GM drawing No. 78051-218 revision [R] and subordinate drawings.

(4) Disassembly, Inspection, Assembly and Limbs Adjustment Procedures for the Hybrid III Dummy, dated July 15, 1986,

(5) Sign Convention for the signal outputs of Hybrid III Dummy Transducers, dated July 15, 1986,

(6) Exterior Dimensions of the Hybrid III Dummy, dated July 15, 1986.

(b) The dummy is made up of the following component assemblies:

Drawing Number		*Revision*
78051-61	Head Assembly–Complete–	(T)
78051-90	Neck Assembly–Complete–	(A)
78051-89	Upper Torso Assembly–Complete–	[(K)]
78051-70	Lower Torso Assembly–Without Pelvic Instrumentation Assembly, Drawing Number 78051-59	[(D)]
86-5001-001	Leg Assembly–Complete (LH)–	[(E)]
86-5001-002	Leg Assembly–Complete (RH)–	[(E)]
78051-123	Arm Assembly–Complete (LH)–	(D)
78051-124	Arm Assembly–Complete (RH)–	(D)

(c) Any specifications and requirements set forth in this part supercede those contained in General Motors Drawing No. 78051-218, revision P.

(d) Adjacent segments are joined in a manner such that throughout the range of motion and also under crash-impact conditions, there is no contact between metallic elements except for contacts that exist under static conditions.

(e) The weights, inertial properties and centers of gravity location of component assemblies shall conform to those listed in drawing 78051-338, revision S.

(f) The structural properties of the dummy are such that the dummy conforms to this part in every respect both before and after being used in vehicle test specified in Standard No. 208 of this Chapter (S 571.208). **(53 F.R. 8755—March 17, 1988. Effective: March 17, 1988)]**

§ 572.32 Head.

(a) The head consists of the assembly shown in the drawing 78051-61, revision T, and shall conform to each of the drawings subtended therein.

(b) When the head (drawing 78051-61, revision T) with neck transducer structural replacement (drawing 78051-383, revision F) is dropped from a height of 14.8 inches in accordance with paragraph (c) of this section, the peak resultant accelerations at the location of the accelerometers mounted in the head in accordance with 572.36(c) shall not be less than 225g, and not more than 275g. The acceleration/time curve for the test shall be unimodal to the extent that oscillations occurring after the main acceleration pulse are less than ten percent (zero to peak) of the main pulse. The lateral acceleration vector shall not exceed 15g (zero to peak).

(c) *Test Procedure.* (1) Soak the head assembly in a test environment at any temperature between 66 degrees F to 78 degrees F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(2) Clean the head's skin surface and the surface of the impact plate with 1,1,1 Trichlorethane or equivalent.

(3) Suspend the head, as shown in Figure 19, so that the lowest point on the forehead is 0.5 inches below the lowest point on the dummy's nose when the midsagittal plane is vertical.

(4) Drop the head from the specified height by means that ensure instant release onto a rigidly supported flat horizontal steel plate, which is 2 inches thick and 2 feet square. The plate shall have a clean, dry surface and any microfinish of not less than 8 microinches (rms) and not more than 80 microinches (rms).

(5) Allow at least 2 hours between successive tests on the same head.

§ 572.33 Neck.

(a) The neck consists of the assembly shown in drawing 78051-90, revision A and conforms to each of the drawings subtended therein.

(b) When the neck and head assembly (consisting of the parts 78051-61, revision T; −84; −90, revision A; −96; −98; −303, revision E; −305; −306; −307, revision X, which has a neck transducer (drawing 83-5001-008) installed in conformance with 572.36(d), is tested in accordance with paragraph (c) of this section, it shall have the following characteristics:

(1) *Flexion.* (i) Plane D, referenced in Figure 20, shall rotate between 64 degrees and 78 degrees, which shall occur between 57 milliseconds (ms) and 64 ms from time zero. In first rebound, the rotation of plane D shall cross 0 degrees between 113 ms and 128 ms.

(ii) The moment measured by the neck transducer (drawing 83-5001-008) about the occipital condyles, referenced in Figure 20, shall be calculated by the following formula: Moment (lbs-ft) = $M_y + 0.02875 \times F_x$, where M_y is the moment measured in lbs-ft by the moment sensor of the neck transducer and F_x is the force measure

measured in lbs by the x axis force sensor of the neck transducer. The moment shall have a maximum value between 65 lbs-ft occurring between 47 ms and 58 ms, and the positive moment shall decay for the first time to 0 lb-ft between 97 ms and 107 ms.

(2) *Extension.* (i) Plane D, referenced in Figure 21, shall rotate between 81 degrees and 106 degrees, which shall occur between 72 and 82 ms from time zero. In first rebound, the rotation of plane D shall cross 0 degree between 147 and 174 ms.

(ii) The moment measured by the neck transducer (drawing 83-5001-008) about the occipital condyles, referenced in Figure 21, shalo be calculated by the following formula: Moment (lbs-ft) = $M_y + 0.02875 \times F_x$, where M_y is the moment measured in lbs-ft by the moment sensor of the neck transducer and F_x is the force measure measured in lbs by the x axis force sensor of the neck transducer. The moment shall have a minimum value between −39 lbs-ft and −59 lbs-ft, which shall occur between 65 ms and 79 ms, and the negative moment shall decay for the first time to 0 lb-ft between 120 ms and 148 ms.

(3) Time zero is defined as the time of contact between the pendulum striker plate and the aluminum honeycomb material.

(c) *Test Procedure.* (1) Soak the test material in a test environment at any temperature between 69 degrees F to 72 degrees F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(2) Torque the jamnut (78051-64) on the neck cable (78051-301, revision E) to 1.0 lbs-ft ±.2 lbs-ft.

(3) Mount the head-neck assembly, defined in paragraph (b) of this section, on a rigid pendulum as shown in Figure 22 so that the head's midsagittal plane is vertical and coincides with the plane of motion of the pendulum's longitudinal axis.

(4) Release the pendulum and allow it to fall freely from a height such that the tangential velocity at the pendulum accelerometer centerline at the instance of contact with the honeycomb is 23.0 ft/sec ± 0.4 ft/sec. for flexion testing and 19.9 ft/sec ± 0.4 ft/sec. for extension testing. The pendulum deceleration vs. time pulse for flexion testing shall conform to the characteristics shown in Table A and the decaying deceleration-time curve shall first cross 5g between 34 ms and 42 ms. The pendulum deceleration vs. time pulse for extension testing shall conform to the characteristics shown in Table B and the decaying deceleration-time curve shall cross 5g between 38 ms and 46 ms.

Table A

Flexion Pendulum Deceleration vs. Time Pulse

Time (ms)	*Flesion deceleration level (g)*
10	22.50—27.50
20	17.60—22.60
30	12.50—18.50
Any other time above 30 ms	29 maximum

Table B

Extension Pendulum Deceleration vs. Time Pulse

Time (ms)	*Extension deceleration level (g)*
10	17.20—21.00
20	14.00—19.00
30	11.00—16.00
Any other time above 30 ms	22 maximum

(5) Allow the neck to flex without impact of the head or neck with any object during the test.

§ 572.34 Thorax.

(a) The thorax consists of the upper torso assembly in drawing 78051-89, revision [K] and shall conform to each of the drawings subtended therein.

(b) [When impacted by a test probe conforming to S 572.36(a) at 22 fps ± .40 fps in accordance with paragraph (c) of this section, the thorax of a complete dummy assembly (78051-218, revision R) with left and right shoes (78051-294 and -295) removed, shall resist with a force of 1242.5 pounds ± 82.5 pounds measured by the test probe and shall have a sternum displacement measured relative to spine of 2.68 inches ±0.18 inches. The internal hysteresis in each impact shall be more than 69% but less than 85%. The force measured is the product of pendulum mass and deceleration.] **(53 F.R. 8755—March 17, 1988. Effective: March 17, 1988)**

(c) *Test procedure.* (1) Soak the test dummy in an environment with a relative humidity from 10% to 70% until the temperature of the ribs of the test dummy have stabilized at a temperature between 69 degrees F and 72 degrees F.

(2) [Seat the dummy without back and arm supports on a surface as shown in Figure 23, and set the angle of the pelvic bone at 13 degrees plus or minus 2 degrees, using the procedure described in S 11.4.3.2 of Standard No. 208 (S 571.208 of this chapter).] **(53 F.R. 8755—March 17, 1988. Effective: March 17, 1988).**

(3) Place the longitudinal centerline of the test probe so that it is .5 in $\pm$ .04 in. below the horizontal centerline of the No. 3 Rib (reference drawing number 79051-64, revision A-M) as shown in Figure 23.

(4) Align the test probe specified in S572.36(a) so that at impact it longitudinal centerline coincides within .5 degree of a horizontal line in the dummy's midsagittal plane.

(5) Impact the thorax with the test probe so that the longitudinal centerline of the test probe falls within 2 degrees of a horizontal line in the dummy's midsagittal plane at the moment of impact.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical, or rotational movement.

(7) Measure the horizontal deflection of the sternum relative to the thoracic spine along the line established by the longitudinal centerline of the probe at the moment of impact, using a potentiometer (ref. drawing 78051-317, revision A) mounted inside the sternum as shown in drawing 78051-89, revision I.

(8) Measure hysteresis by determining the ratio of the area between the loading and unloading portions of the force deflection curve to the area under the loading portion of the curve.

§ 572.35 Limbs.

(a) The limbs consist of the following assemblies: leg assemblies 86-5001-001 and -002 and arm assemblies 78051-123, revision D, and -124, revision D, and shall conform to the drawings subtended therein.

(b) [When each knee of the leg assemblies is impacted, in accordance with paragraph (c) of this section, at 6.9 ft/sec $\pm$0.10 ft/sec., by the pendulum defined in S 572.36(b), the peak knee impact force, which is a product of pendulum mass and acceleration, shall have a minimum value of not less than 1060 pounds and a maximum value of not more than 1300 pounds.] **(53 F.R. 8755—March 17, 1988. Effective: March 17, 1988)**

(c) *Test Procedure.* (c) The test material consists of leg assemblies (86-5001-001) left and (-002) right with upper leg assemblies (78051-46) left and (78051-47) right removed. The load cell simulator (78051-319, revision A) is used to secure the knee cap assemblies (79051-16, revision B) as shown in Figure 24.

(2) Soak the test material in a test environment at any temperature between 66 degrees F to 78 degrees F and at a relative humidity from 10% to 70% for a period of at least four hours prior to its application in a test.

(3) Mount the test material with the leg assembly secured through the load cell simulator to a rigid surface as shown in Figure 24. No contact is permitted between the foot and any other exterior surfaces.

(4) Place the longitudinal centerline of the test probe so that at contact with the knee it is colinear within 2 degrees with the longitudinal centerline of the femur load cell simulator.

(5) Guide the pendulum so that there is no significant lateral, vertical or rotational movement at time zero.

(6) Impact the knee with the test probe so that the longitudinal centerline of the test probe at the instant of impact falls within .5 degrees of a horizontal line parallel to the femur load cell simulator at time zero.

(7) Time zero is defined as the time of contact between the test probe and the knee.

§ 572.36 Test Conditions and Instrumentation.

(a) The test probe used for thoracic impact tests is a 6 inch diameter cylinder that weighs 51.5 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid and has an edge radius of 0.5 inches. The test probe has an accelerometer mounted on the end opposite from impact with its sensitive axis colinear to the longitudinal centerline of the cylinder.

(b) The test probe used for the knee impact tests is a 3 inch diamenter cylinder that weighs 11 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid and has an edge radius of 0.2 inches. The test probe has an accelerometer mounted on the end opposite from impact with its sensitive axis colinear to the longitudinal centerline of the cylinder.

(c) Head accelerometers shall have dimensions, response characteristics and sensitive mass locations specified in drawing 78051-136, revision A or its equivalent and be mounted in the head as shown in drawing 78051-61, revision T, and in the assembly shown in drawing 78051-218, revision R.

(d) The neck transducer shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing 83-5001-008 or its equivalent and be mounted for testing as shown in drawing 79051-63, revision W, and in the assembly shown in drawing 78051-218, revision R.

(e) The chest accelerometers shall have the dimensions, response characteristics, and sensitive mass locations specified in drawing 78051-136, revision A or its equivalent and be mounted as shown with adaptor assembly 78051-116, revision D for assembly into 78051-218, revision R.

(f) The chest deflection transducer shall have the dimensions and response characteristics specified in drawing 78051-342, revision A or equivalent and be mounted in the chest deflection transducer assembly 87051-317, revision A for assembly into 78051-218, revision R.

(g) The thorax and knee impactor accelerometers shall have the dimensions and characteristics of Endevco Model 7231c or equivalent. Each accelerometer shall be mounted with its sensitive axis colinear with the pendulum's longitudinal centerline.

(h) The femur load cell shall have the dimensions, response characteristics, and sensitive axis locations specified in drawing 78051-265 or its equivalent and be mounted in assemblies 78051-46 and -47 for assembly into 78051-218, revision R.

(i) The outputs of acceleration and force-sensing devices installed in the dummy and in the test apparatus specified by this part are recorded in individual data channels that conform to the requirements of SAE Recommended Practice J211, JUN 1980, "Instrumentation for Impact Tests," with channel classes as follows:

(1) Head acceleration—Class 1000
(2) Neck force—Class 60
(3) Neck pendulum acceleration—Class 60
(4) Thorax and thorax pendulum acceleration—Class 180
(5) Thorax deflection—Class 180
(6) Knee pendulum acceleration—Class 600
(7) Femur force—Class 600

(j) Coordinate signs for instrumentation polarity conform to the sign convention shown in the document incorporated by §572.31(a)(5).

(k) The mountings for sensing devices shall have no resonance frequency within range of 3 times the frequency range of the applicable channel class.

(l) Limb joints are set at lg, barely restraining the weight of the limb when it is extended horizontally. The force required to move a limb segment shall not exceed 2g throughout the range of limb motion.

(m) Performance tests of the same component, segment, assembly, or fully assembled dummy are separated in time by a period of not less than 30 minutes unless otherwise noted.

(n) Surfaces of dummy components are not painted except as specified in this part or in drawings subtended by this part.

[§ 572.40 Incorporated Materials.

(a) The drawings, specifications, and computer program referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. These materials are there by made part of this regulation. The Director of the Federal Register has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the Federal Register and specified in the regulation are incorporated. A notice of any change will be published in the *Federal Register*. As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the *Code of Federal Regulations*.

(b) The materials incorporated in this part by reference are available for examination in the

general reference section of Docket 79-04, Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, S.W. Washington, D.C. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1111 14th Street, N.W., Washington, D.C. 20005, telephone (202) 628-6667 or 408-8789.

[§ 572.41 General Description.

(a) The dummy consists of component parts and component assemblies (SA-SID-M001 and SA-SID-M001A) which are described in approximately 250 drawings and specifications that are set forth in Part 572.5(a) of this Chapter with the following changes and additions which are described in approximately 85 drawings and specifications:

(1) The head assembly consists of the assembly specified in Subpart B (§ 572.6(a)) and conforms to each of the drawings subtended under drawing SA 150 M 010 and drawings specified in SA-SID-M010 of this subpart.

(2) The neck assembly consists of the assembly specified in Subpart B (§ 572.7(a)) and conforms to each of the drawings subtended under drawing SA-150-M020 and drawings shown in SA-SID-M010.

(3) The thorax assembly consists of the assembly shown as number SID-053 and conforms to each applicable drawing subtended by number SA-SID-M030.

(4) The lumbar spine consists of the assembly specified in Subpart B (§ 572.9(a)) and conforms to drawing SA-150-M050 and drawings subtended by SA-SID-M050 specified by this part.

(5) The abdomen and pelvis consist of the assembly specified in Subpart B (§ 572.9) and conform to the drawings subtended by SA-150-M060 and drawings subtended by SA-SID-M060 specified by this Subpart.

(6) The lower limbs consist of the assemblies specified in Subpart B (§ 572.10) shown as SA-150-M080 and SA-150-M081 in Figure 1 and SA-SID-M080 and SA-SID-M081 and conform to the drawings subtended by those numbers.

(b) The structural properties of the dummy are such that the dummy conforms to the requirements of this subpart in every respect both before and after being used in vehicle tests specified in Standard No. 214 (Part 571.214 of this Chapter).

(c) Disassembly, inspection, and assembly procedures; external dimensions and weight; and a dummy drawing list are set forth in the Side Impact Dummy (SID) User's Manual, dated July 1990.

[§ 572.42 Thorax.

(a) When the thorax of a completely assembled dummy (SA-SID-M001A), appropriately assembled for right or left side impact, is impacted by a test probe conforming to § 572.44(a) at 14 fps in accordance with paragraph (b) of this section, the peak accelerations at the location of the accelerometers mounted on the thorax in accordance with § 572.44(b) shall be:

1. for the accelerometer at the top of the Rib Bar on the struck side (LUR or RUR) not less than 37 g's and not more than 46 g's.

2. for the accelerometer at the bottom of the Rib Bar on the struck side (LLR or RLR) not less than 37 g's and not more than 46 g's.

3. for the lower thoracic spine (T12)not less than 15 g's and not more than 22 g's.

(b) *Test Procedure* (1) Adjust the dummy legs as specified in §572.44(f). Seat the dummy on a seating surface as specified in § 572.44(h) with the limbs extended horizontally forward.

(2) Place the longitudinal centerline of the test probe at the lateral side of the chest at the intersection of the centerlines of the third rib and the Rib Bar on the desired side of impact. This is the left side if the dummy is to be used on the driver's side of the vehicle and the right side if the dummy is to be used on the passenger side of the vehicle. The probe's centerline is perpendicular to the thorax's midsagittal plane.

(3) Align the test probe so that its longitudinal centerline coincides with the line formed by the intersection of the transverse and frontal planes perpendicular to the chest's midsagittal plane passing through the designated impact point.

(4) Position the dummy as specified in § 572.44(h), so that the thorax's midsagittal plane and tangential plane to the Hinge Mounting Block (Drawing SID-034) are vertical.

(5) Impact the thorax with the test probe so that at the moment of impact at the designated impact point, the probe's longitudinal centerline falls within 2 degrees of a horizontal line perpendicular

to the dummy's midsagittal plane and passing through the designated impact point.

(6) Guide the probe during impact so that it moves with no significant lateral, vertical or rotational movement.

(7) Allow a time period of at least 20 minutes between successive tests of the chest.

[§ 572.43 Lumbar spine and pelvis.

(a) When the pelvis of a fully assembled dummy (SA-SID-M001A) is impacted laterally by a test probe conforming to § 572.44(a) at 14 fps in accordance with paragraph (b) of this section, the peak accleration at the location of the accelerometer mounted in the pelvis cavity in accordance with § 572.44(c) shall be not less than 40g and not more han 60g. The acceleration-time curve for the test shall be unimodal and shall lie at or above the ±20g level for interval not less than 3 milliseconds and not more than 7 milliseconds.

(b) *Test Procedure.* (1) Adjust the dummy legs as specified in § 572.44(f). Seat the dummy on a seating surface as specified in § 572.44(h) with the limbs extended horizontally forward.

(2) Place the longitudinal centerline of the test probe at the lateral side of the pelvis at a point 3.9 inches vertical from the seating surface and 4.8 inches ventral to a transverse vertical plane which is tangent to the back of the dummy's buttocks.

(3) Align the test probe so that at impact its longitudinal centerline coincides with the line formed by intersection of the horizontal and vertical planes perpendicular to the midsagittal plane passing through the designated impact point.

(4) Adjust the dummy so that its midsagittal plane is vertical and the rear surfaces of the throax and buttocks are tangent to a transverse vertical plane.

(5) Impact the pelvis with the test probe so that at the moment of imact the probe's longitudinal centerline falls within 2 degrees of the line specified in (3) above.

(6) Guide the test probe during impact so that it moves with no significant lateral, vertical or rotational movement.

(7) Allow a time period of at least 2 hours between successive tests of the pelvis.

[§ 572.44 Instrumentation and test conditions.

(a) The test probe used for lateral thoracic and pelvis impact tests is a 6 inch diameter cylinder that weighs 51.5 pounds including instrumentation. Its impacting end has a flat right angle face that is rigid hand has an edge radius of 0.5 inches.

(b) Three accelerometers are mounted in the thrax for measurement of lateral accelerations with each accelerometer's sensitive axis aligned to be closely perpendicular to the thorax's midsagittal plane. The accelerometers are mounted in the following locations:

(1) One accelerometer is mounted on the Thorax to Lumbar Adaptor (SID-005) by means of a T12 Accelerometer Mounting Platform (SID-009) and T12 Accelerometer Mount (SID-038) with its seismic mass center at any distance up to 0.4 inches from a surface point on the Thorax to Lumbar Adaptor where two perpendicular planes aligned with the adaptor's vertical and horizontal center lines intersect.

(2) Two accelerometers are mounted, one on the top and the other at the bottom part of the Rib Bar (SID-024) on the struck side. Their seismic mass centers are at any distance up to .4 inches from a point on the Rib Bar surface located on its longitudinal center line .75 inches from the top for the top accelerometer and .75 inches from the bottom, for the bottom accelerometer.

(c) One accelerometer is mounted in the pelvis for measurement of the lateral acceleration with its sensitive axis perpendicular to the pelvic midsagittal plane. The accelerometer is mounted on the rear wall of the instrument cavity (Drawing SID-087), with its seismic mass center located up to 0.30 inches from the point of intersection of the cover plate centerlines and 0.34 inches rearward of the rear wall of the instrument cavity.

(d) Instrumention and sensors used must conform to the SAE J-211 (1980) recommended practice requirements. The outputs of the accelerometers installed in the dummy are them processed with the software for the Finite Impulse Response (FIR) filter (FIR 100 software). The FORTRAN program for this FIR 100 software (FIR100 Filter Program, Version 1.0, July 16, 1990) is incorporated by reference in this Part. The data are processed in the following manner:

(1) Analong data recorded in accordance with SAE J-211 (1980) recommended practice channel class 1000 specification.

(2) Filter the data with a 300 Hz, SAE Class 180 filter;

(3) Subsample the data to a 1600 Hz sampling rate;

(4) Remove the bias from the subsampled data, and;

(5) Filter the data with the FIR100 Filter Program (Version 1.0, July 16, 1990), which has the following characteristics—

(A) Passband frequency, 100 Hz.

(B) Stopband frequency, 189 Hz.

(C) Stopband gain, −50 db.

(D) Passband ripple, 0.0225 db.

(e) The mountings for the spine, rib and pelvis accelerometers shall have no resonance frequency within a range of 3 times the frequency range of the applicable channel class.

(f) Limb joints of the test dummy are set at the force between 1–2 g's, which just supports the limbs' weight when the limbs are extended horizontally forward. The force required to move a limb segment does not exceed 2 g's throughout the range of limb motion.

(g) Performance tests are conducted at any temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent after exposure of the dummy to these conditions for a period of not less than 4 hours.

(h) For the performance of tests specified in §§ 572.42 and 572.43, the dummy is positioned as follows:

(1) The dummy is placed on a flat, rigid, clean, dry, horizontal smooth aluminum surface whose length and width dimensions are not less than 16 inches, so that the dummy's midsagittal plane is vertical and centered on the test surface. The dummy's torso is positioned to meet the requirements of § 572.42 and § 572.43. The seating surface is without the back support and the test dummy is positioned so that the dummy's midsagittal plane is vertical and centered on the seat surface.

(2) The legs are positioned so that their centerlines are in planes parallel to the midsagittal plane.

(3) Performance pre-tests of the assembled dummy are separated in time by a period of not less than 20 minutes unless otherwise specified.

(4) Surfaces of the dummy components are not painted except as specified in this part or in drawings subtended by this part. **(55 F.R. 45757—October 30, 1990. Effective: November 29, 1990)]**

PREAMBLE TO AN AMENDMENT TO PART 574
Tire Identification and Record Keeping

(Docket No. 87–12; Notice 3)
RIN 2127–AC18

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars,* to permit new passenger cars, multipurpose passenger vehicles, and light trucks equipped with passenger car tires to be equipped with a non-pneumatic spare tire. These standards had required all new vehicles to be equipped with pneumatic tires. The notice also establishes requirements requiring non-pneumatic tires to bear a label stating that the tires are to be used only as a temporary spare tire and only at limited speeds. It requires the manufacturer to place a placard in the vehicle and information in the owner's manual explaining the proper use of these tires. In addition, the notice establishes Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* which includes definitions relevant to non-pneumatic tires and specifies performance, testing, and additional labeling requirements for these tires. In particular, the new standard contains performance requirements related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. The agency has determined that these requirements provide the basic tests to ensure the structural integrity of non-pneumatic tires. To ensure an even higher degree of safety, a non-pneumatic tire must be labeled for use only as a temporary spare tire at limited speeds. NHTSA believes that these performance requirements together with these labels ensure the safety of non-pneumatic tires.

EFFECTIVE DATE: The rule is effective on August 20, 1990.

SUPPLEMENTARY INFORMATION:

I. *General Information*

Federal Motor Vehicle Safety Standard No. 110, *Tire Selection and Rims* (49 CFR §571.110), specifies requirements for the selection of tires to be used on passenger cars. Standard No. 120, *Tire Selection and Rims for Vehicles Other Than Passenger Cars* (49 CFR §571.120), specifies similar requirements for the selection of tires to be used on vehicles other than passenger cars. The purpose of these standards is to prevent tire overloading and to facilitate the proper matching of a tire and rim to a vehicle. They also require a vehicle manufacturer to place in each new vehicle a placard bearing information to ensure use at the proper inflation.

Section S4.1 of Standard No. 110 requires passenger cars to be equipped with tires that meet the requirements of §571.109, "New Pneumatic Tires—Passenger Cars" (49 CFR §571.109). Section S5.1.1 of Standard No. 120 similarly requires vehicles other than passenger cars to be equipped with pneumatic tires that meet the requirements of Standard No. 109 or Standard No. 119 "New Pneumatic Tires for Vehicles Other Than Passenger Cars" (49 CFR §571.119).

Standard No. 109 expressly applies only to new pneumatic tires which it defines as "mechanical device(s) . . . (that) contain the *gas* or fluid that sustains the load" (emphasis added). The standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength (in vertical loading), tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

The practical effect of Standard No. 109's applicability to only pneumatic tires, together with Standard No. 110's requirement that passenger cars must be equipped with tires that meet Standard No. 109's requirements, is to prohibit any new passenger car from being equipped with non-pneumatic tires. Similarly, Standard Nos. 109, 119 and 120 together prohibit any vehicle subject to Standard No. 120 from being equipped with non-pneumatic tires.

A non-pneumatic tire is a mechanical device which serves the same function as a pneumatic tire. That is, it transmits the vertical load and tractive forces from the roadway to the vehicle and generates the tractive forces that provide the directional con-

trol of the vehicle. However, the non-pneumatic tire differs from the pneumatic tire in that the former does not rely on air pressure or the containment of any gas or fluid for providing those functions. A non-pneumatic tire may be designed in many different ways. For instance, it may be solid rubber to which tread is attached; it may be part of an assembly in which the wheel is attached to the tire and tread; or it may contain the tread, tire, rim, and wheel. Further, many different materials may be used in constructing the tire assembly. Because non-pneumatic tires present an emerging technology, it is likely that tire manufacturers may develop new designs and use materials that are currently not known or contemplated.

In view of Standard No. 109's and Standard No. 110's prohibition of tires other than pneumatic tires on motor vehicles, General Motors (GM) petitioned the agency to amend Standard No. 109 to allow non-pneumatic spare tire assemblies for temporary use on passenger cars. The petitioner suggested performance requirements and test conditions for non-pneumatic tires that would address characteristics such as the endurance, high speed performance, strength (in vertical loading), and lateral strength of the non-pneumatic tire. In large part, GM used the existing requirements in Standard No. 109 as a guide for selecting the performance requirements and test conditions for the requested amendment. It changed the requirement and test related to the bead unseating resistance, which specifically relates to pneumatic tires, and also changed the test procedure and strength requirements for the tire's ability to withstand concentrated vertical loads. In addition, GM suggested certain labeling requirements including a warning that the tires would be for temporary use.

GM submitted its petition in connection with its work with Uniroyal Goodrich Co. (Uniroyal) to develop a spare non-pneumatic tire which it intends for only temporary use. The petitioner believes that the agency's adoption of its requested amendment would reduce the weight and size of the spare tires used in passenger cars, resulting in reduced costs, improved reliability and servicability, and minor improvements in fuel economy. Because a non-pneumatic tire is not dependent on air pressure, it would not be subject to problems associated with low inflation pressure such as a blow out or bead unseating during hard cornering.

On September 23, 1987, NHTSA issued a notice announcing the grant of GM's petition and requesting comments about non-pneumatic tires (52 FR 35740). The notice invited comment about what requirements would be necessary to ensure the safe use of a non-pneumatic tire. In response to that notice, NHTSA received comments from various motor vehicle and tire manufacturers as well as the Rubber Manufacturers Association. NHTSA considered each of these comments in developing a notice of proposed rulemaking (NPRM) which it published on April 7, 1989 (54 FR 14109).

II. *Notice of Proposed Rulemaking*

In the NPRM, NHTSA proposed to amend Standard No. 110 to permit the use of non-pneumatic tires on passenger cars, but only as a temporary spare and to establish a new standard for non-pneumatic tires. The notice requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109. As a general proposition, the NPRM explained that in developing the new safety standard, the agency desired to formulate a generic one that would be applicable to as many potential designs of non-pneumatic tires as possible rather than one that was based on a specific design, which might inadvertently restrict future developments and skew innovations toward the initial design.

More specifically, the notice proposed three amendments to Standard No. 110. First, it proposed that section S4.1 be amended to allow passenger cars to be equipped with a non-pneumatic spare tire. Second, the notice proposed that Standard No. 110 contain additional labeling requirements and vehicle placarding requirements explaining that such tires should be used only as a spare tire on a temporary basis at speeds not to exceed 50 m.p.h. Third, the notice proposed that safety information about the use of a non-pneumatic tire be included in the owner's manual of the passenger car.

The proposed new safety standard was Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars.* According to the proposal, the new standard, which was patterned after Standard No. 109, would include definitions relevant to non-pneumatic tires and specify performance requirements, testing procedures, and labeling requirements for these tires. To regulate performance, the new standard would contain performance requirements and tests related to physical dimensions, lateral strength, strength (in vertical loading), tire endurance, and high speed performance. While the agency considered proposing requirements related to additional factors such as handling and braking, it tentatively determined that the proposed requirements would adequately ensure motor vehicle safety by providing the basic tests necessary to ensure the structural integrity and durability of non-pneumatic tires.

The NPRM also proposed to supplement the labeling requirements in Standard No. 110 by including in Standard No. 129 labeling requirements similar

to those set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and the tire identification number. The notice proposed to allow methods of marking other than "molding," provided the marking was permanent because the agency tentatively concluded that it might be difficult to mold the required information on some types of anticipated non-pneumatic tire designs. The agency also tentatively concluded that the temporary use and maximum speed labeling requirements would provide an extra margin of safety related to handling and braking. In addition, the agency noted that compact pneumatic T-type tires that are currently used as temporary spare tires have been shown to be safe, even though they are not subject to performance requirements beyond those applicable to full size tires in Standard No. 109. The agency believed that in some respects this comparison was relevant since, like the compact T-type pneumatic tires, the non-pneumatic tires allowed by these amendments would be limited to use as temporary spare tires.

The agency tentatively concluded that the proposed performance requirements, together with the proposed labeling requirements, would remove a restriction in the existing standards on technological innovation while still ensuring that the new non-pneumatic tires met the need for safety.

III. *The Comments and the Agency Response*

NHTSA received 13 comments in response to the NPRM. In general, all commenters supported the proposal to permit a vehicle to be equipped with a non-pneumatic spare tire. The agency has considered the points in the comments in developing this final rule. The commenters' significant points are addressed below, along with the agency's response to the comments. For the convenience of the reader, this notice follows the regulatory text's order.

A. *Proposal to Amend Standard No. 110*

Definitions

The NPRM proposed to add definitions to paragraph S3 for "non-pneumatic spare tire assembly," "non-pneumatic tire," "non-pneumatic tire assembly," "rim," and "wheel center member." The agency intended these definitions to be general in order to better ensure a generic standard appropriate to any type of non-pneumatic tire. These definitions were patterned after analogous definitions in NHTSA's safety standard for pneumatic tires and SAE Recommended Practice J328a, "Wheels—Passenger Cars—Performance Requirements and Test Procedures."

The agency received two comments about the proposed definitions. Michelin requested that the definition of a "non-pneumatic spare tire assembly", which was defined as a device "intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car . . .", be revised to state that the NPSTA be "in support of" as well as "in place of." According to the commenter, this modification would allow future NPSTAs to be fitted on tire and wheel assemblies without removing the deflated pneumatic tire. The agency has decided not to adopt Michelin's suggestion which is beyond the scope of the current proposal and its test procedures. Further, the agency needs more information about devices used "in support of" a deflated pneumatic tire, especially about the procedures for testing them while they are mounted on a deflated pneumatic tire. Therefore, NHTSA has decided not to expand the definition as requested by Michelin.

Uniroyal suggested that the agency move the definition of "rim" from the definition section (S3) to the requirements section (S4.4). The agency has decided not to adopt this suggestion which is unnecessary and contrary to standard regulatory drafting. The agency notes that it is modifying the definition of "rim" to "non-pneumatic rim" and "test rim" to "non-pneumatic test rim." This change will help to distinguish between conventional rims for pneumatic tires and rims for non-pneumatic tires. The notice adopts this distinction throughout Standards 110, 120, and 129.

Labeling Requirements

The NPRM proposed labeling requirements for non-pneumatic spare tires and tire assemblies in section S6 of Standard No. 110. The proposal specified that the information had to be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" and not be smaller than a given size. The proposal explained that it was proposing to allow different methods of permanent marking in addition to molding, the labeling method required in Standard No. 109, because it might be difficult to mold the required information into or onto some non-pneumatic tire and assembly designs. It also proposed that the labeling on each non-pneumatic spare tire would state "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation(s) of the pneumatic tire(s) that the non-pneumatic tire was intended to replace. This notice will respond separately to each of the commenters concerns.

Uniroyal requested the agency to modify the requirement that non-pneumatic spare tires be "permanently molded, stamped, or otherwise permanently marked into or onto both sides" to allow a permanently affixed label to contain the required information. It specifically stated that paper or plastic labels should be allowed as an alternative

technique to comply with S6. NHTSA notes that the key criteria related to informational marking requirements is that the message be useful and understandable for the lifetime of the tire. Thus, a message must be permanent, legible, and conspicuous. After reviewing Uniroyal's request, the agency believes that affixing a permanent label on a non-pneumatic tire would not meet these ends. The agency is concerned that a paper label would not be permanent given that it would be exposed to environmental factors such as rain, snow, road salt, car wash brushes and detergents. The agency is especially concerned that there is nothing to prevent a paper label from disintegrating when exposed to the elements or being rubbed off by a curb. Similarly, there is nothing to prevent the printing on the label from becoming illegible. The agency therefore has decided not to permit a label as an alternative technique to comply with S6.

Section S6(a) contained a proposal that each non-pneumatic spare tire be labeled "FOR TEMPORARY USE ONLY." The NPRM explained that this mandatory warning would be in the interest of motor vehicle safety by encouraging the limited use of non-pneumatic tires as a replacement for T-type temporary spare tires. The agency further believed such labeling would provide consumers with valuable guidance about this new type of tire. All commenters mentioning the proposal to require temporary use labeling agreed that it had merit given the current level of technology and agreed that the extended use of a non-pneumatic tire would be inappropriate.

Section S6(b) contained a proposal that each non-pneumatic spare tire be labeled "MAXIMUM 50 M.P.H." The NPRM stated that this maximum speed warning, like the temporary use warning, would be in the interest of safety. The notice further explained that the Economic Commission for Europe (ECE) Regulation 64 contains a maximum speed warning of 80 kilometers per hour (49.7 m.p.h.) in response to concerns over the potential for some degradations in the braking and handling performance of a vehicle fitted with a temporary spare tire. The notice continued that even though these concerns did not directly relate to a tire's structural failure, the agency believed that a maximum speed warning would improve the total safety of the vehicle because any potential problems associated with handling, control, stability, and braking are typically exacerbated at faster speeds. It also stated that a maximum speed warning would serve to deter some motorists from driving with a non-pneumatic tire on an extended basis.

NHTSA received four comments on the proposal to require a maximum speed warning of 50 m.p.h. While Goodyear and Firestone supported the proposal, Uniroyal and General Motors opposed it, stating that it should be at the discretion of the vehicle manufacturer, the entity responsible for the vehicle's braking, handling, and other performance characteristics. Uniroyal stated that such a requirement is unnecessary since T-type pneumatic spares are not required to have such labeling. It also commented that the maximum speed labeling in ECE Regulation 64 is inapplicable to the non-pneumatic spare, since the non-pneumatic tire would be subject to more stringent performance requirements. GM commented that a maximum speed labeling requirement was not warranted, stating that "there is no generic technical or safety reason for it," a non-pneumatic spare tire is not different from current temporary compact spare tires, the maximum recommended speed of 50 m.p.h. might unduly alarm some drivers, and consumers might misinterpret the "50 *m.p.h.* speed" label as a "50 *mile* use" restriction.

After reviewing the maximum speed labeling requirement in light of these comments, NHTSA continues to believe that such a requirement would be in the interest of safety. The agency notes that according to information provided by Uniroyal, there are some differences in performance characteristics between non-pneumatic spare tires and pneumatic spares. For instance, the non-pneumatic tire tends to "nibble," i.e., generate lateral forces when crossing a longitudinal road irregularity. While differences with conventional pneumatic spare tires are not significant enough to justify a prohibition of non-pneumatic tires, these relative shortcomings, which might alarm a driver unfamiliar with them, appear to be exacerbated at greater speeds. Until more experience is gained with non-pneumatic tires, the agency believes that GM's claim that there is no safety reason to justify maximum speed labeling is premature. The agency notes that GM included a 50 m.p.h. maximum speed marking on its pneumatic temporary spare tire for the first five years after its introduction, suggesting that a newly introduced temporary tire design should contain such a maximum speed warning. Based on the above considerations, the agency concludes that to satisfy the Vehicle Safety Act's mandate, the 50 m.p.h. maximum speed marking must be a mandatory requirement and not be left to the manufacturers' discretion.

Section S6(c) of Standard No. 110 contained a proposal that the non-pneumatic tire be labeled with the "size designation(s) of the pneumatic tires that this non-pneumatic tire spare assembly is intended to replace or, at the manufacturer's option, is capable of replacing." All those who commented on this provision opposed it, stating that the requirement could result in lengthy information that might confuse consumers. For instance, a consumer might mistakenly conclude that a 15 inch non-pneumatic

tire could replace any 15 inch pneumatic tire. They claimed that this incorrect assumption could be dangerous given the potential for many vehicle specific non-pneumatic tire and tire assembly designs. In place of this proposal, Uniroyal, Firestone, and GM suggested that the tires be labeled with a vehicle manufacturer's part number, with GM recommending a "non-pneumatic spare tire identifying code" (e.g., "ABC") as an alternative. The State of Connecticut recommended that the non-pneumatic spare tire be labeled to indicate specifically the vehicle(s) on which it is intended to be used. In contrast, Goodyear and Uniroyal criticized requiring vehicle specific marking, stating that the labeling on a tire with multiple vehicle applications could be lengthy, confusing, and thus possibly dangerous.

After reviewing these comments, NHTSA has determined that instead of designations of the pneumatic tires replaced, a "non-pneumatic tire identifying code (NPTIC)" should be required to identify a non-pneumatic tire. Like the tire size designation of a pneumatic tire, the NPTIC's purpose is to provide consumers information about the proper application of a non-pneumatic tire. The agency believes that this method of identification is superior to requiring a non-pneumatic tire to be labeled with the pneumatic tire size or the non-pneumatic spare tire's specific vehicle application(s) given the potential for many different non-pneumatic tire designs. A manufacturer may still mark specific vehicle application(s) on the tire provided that the additional information did not obscure or confuse the required information. Manufacturers are urged, therefore, to avoid unnecessarily long vehicle application information or unnecessarily long identifying codes. Based on the above considerations, the manufacturer will be required to label a non-pneumatic spare tire or spare tire assembly with a "non-pneumatic tire identification code," (NPTIC), which is defined in section S3 of Standard 129. A manufacturer also is required to place the NPTIC on the vehicle placard and in the owner's manual. In addition, the NPTIC will replace any reference in the regulatory text to the "non-pneumatic tire size designation."

Vehicle Placarding

Section S7 of the Standard No. 110 contained proposed requirements for vehicle placards. Under the proposal, the placard would state, in letters not less than 1.0 inch high, "CAUTION—USE AS SPARE TIRE," and in letters not less than 0.5 inches high, "FOR TEMPORARY USE ONLY," "MAXIMUM 50 M.P.H.," and the size designation of the pneumatic tire to be replaced. The agency believed that this information would help explain that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time.

Volkswagen commented that the size of the lettering proposed in S7.1 would result in a placard that was too large to easily fit in the trunk. Thus, it requested that the standard require the words to be "legible and conspicuous," or in the alternative, to change the 1.0 inch requirement to ⅜ inch and the ½ inch requirement to ¼ inch. NHTSA rejects the first suggestion because the Vehicle Safety Act requires its requirements to be stated in objective terms. However, it has decided to adopt the requested size reductions which the agency believes will be less intrusive but still conspicuous.

GM and Uniroyal opposed the vehicle placarding requirements as being unnecessary and costly. GM based its opposition to these requirements on its earlier arguments against the labeling requirements. NHTSA believes that the placarding requirements are necessary for the reasons provided in support of the labeling requirements in S6. The agency also disagrees that placarding would be unreasonably costly, especially since most vehicle trunks currently contain a placard explaining the use of jacks and spare tires. The information required by this provision could be easily added to that placard. Even for a vehicle without such a placard, the cost of adding a placard would be minimal.

Uniroyal claimed that the words "Danger" and "Caution" might unduly alarm consumers. NHTSA notes that the placard's purpose is to ensure that a person installing a non-pneumatic spare tire on a vehicle is made aware of its proper use and that it should be used only as a spare tire, even if he or she fails to notice the labeling on the tire itself. Because the word "caution" is not essential to this purpose and some consumers might be unduly alarmed by this word, the agency is modifying the placard to state "IMPORTANT—USE OF SPARE TIRE" rather than "CAUTION—USE OF SPARE TIRE."

Supplementary Information

Section S7.2 of Standard No. 110 proposed that the owner's manual of a passenger car equipped with a non-pneumatic spare tire contain information explaining its proper use. This information, which was patterned after ECE Regulation 64, included instructions that a non-pneumatic tire should be used only as a spare tire at limited speeds for a limited period of time, that the driver should drive with caution when using a non-pneumatic tire, that he or she should replace it with a pneumatic tire and rim as soon as possible, and that a vehicle should not be operated with more than one non-pneumatic tire at one time.

Uniroyal and GM objected to the proposal to require an owner's manual to contain information

about a non-pneumatic tire's use. Uniroyal restated its view that non-pneumatic tires should not be singled out for informational requirements with which pneumatic spare tires are not required to comply. GM stated that requiring warnings on the tire, on a placard, and in the owner's manual was a "costly redundancy" that would discourage the use of such tires.

NHTSA continues to believe that the requirements in S7.2 provide valuable safety information about non-pneumatic tires, a new type of tire design with which consumers will be less familiar than temporary pneumatic tires. As for GM's criticism that this requirement would result in a "costly redundancy," the agency believes that requiring the safety information to appear in each of the proposed locations provides a safety benefit. It is reasonable to label the tire since a motorist must handle the tire itself before installing it on the vehicle. It is also reasonable to require the information on a placard in the trunk near where the spare tire is stored, because a motorist may not notice the information on the tire, especially at night or during inclement weather. Similarly, it is reasonable to supplement these brief messages with more detailed information in the owner's manual, since a motorist typically consults his or her owner's manual when seeking detailed information about vehicle usage.

In response to GM's concern that these warnings might discourage motorists from using non-pneumatic tires, the agency has modified some of the wording. As with the placard's wording, the agency has substituted the word "IMPORTANT" for "CAUTION" to make the label less threatening. It has also changed S7.2(b) to state "An instruction to drive carefully when the non-pneumatic tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity." The agency believes that this wording will continue to convey guidance concerning the proper use of non-pneumatic tires while helping to avoid arousing "undue concern."

B. *Standard No. 129*

Application

The agency proposed in section S2 of Standard No. 129 that the new standard apply to "new temporary spare non-pneumatic tires for use on passenger cars." In other words, the proposal, in conjunction with the proposed amendment to Standard No. 110, would permit a non-pneumatic tire to be used as a spare tire on passenger cars. The NPRM explained that the petitioner only sought to allow non-pneumatic tires as a replacement for T-type pneumatic temporary tires on passenger cars. It further noted that 95 percent of T-type tires were used on passenger cars with the remaining 5 percent on light trucks. The agency requested comments concerning whether Standard No. 129 should permit the use of a non-pneumatic spare tire on light trucks currently equipped with compact temporary spare tires subject to Standard No. 109.

No commenter supported limiting the use of non-pneumatic tires to passenger cars. Instead, Chrysler, Goodyear, Uniroyal, RMA, Firestone, and GM commented that the agency should extend the applicability of Standard No. 129 to permit use of non-pneumatic spare tires on light trucks and similar vehicles that use passenger car temporary tires. For instance, Uniroyal stated that the agency should not restrict the non-pneumatic spare tire to passenger cars given that many new light trucks and vans are equipped with passenger car tires.

NHTSA agrees with the comments and has decided to permit the use of a non-pneumatic spare tire on any vehicle that is equipped with passenger car tires. Accordingly, the agency is revising section S5.1.1 to permit the use of a non-pneumatic temporary spare tire assembly on vehicles subject to Standard No. 120 such as light trucks provided that the vehicle is equipped with passenger car tires. In addition, amendments, like those to Standard No. 110, are made to Standard No. 120 to include new informational requirements for tire labeling, vehicle placarding, and the owner's manual.

Definitions

Commenters made suggestions to modify certain proposed definitions. Firestone recommended that the portion of the definition for "non-pneumatic tire" stating that the tire "does not rely on the containment of any gas or fluid" be changed to state that the tire "does not *primarily*" rely on such containment (emphasis added). NHTSA has decided to reject Firestone's suggestion and adopt the definition as proposed because the suggested change would inject uncertainty about whether a tire should be classified as pneumatic or non-pneumatic. For instance, it might be ambiguous whether a pneumatic tire with "run-flat" capability is a non-pneumatic tire under Firestone's suggested definition.

Goodyear, Uniroyal, and RMA suggested that the definition for "tread" be changed by deleting reference to the tread's being "intended to wear away during normal use of the tire." NHTSA agrees with this suggestion which will make the definition for "tread" in Standard No. 129 consistent with the one in Standard No. 109.

Uniroyal suggested that the definition for "maximum tire width," should be changed so that it uses the phrase "exterior edges" in place of "outer and inner surfaces" which appears in reference to

"carcass" and "tread." The agency has decided to adopt the suggested wording which it believes provides a more generic and thus more appropriate definition.

The agency is introducing a definition for "Non-pneumatic tire identification code" (i.e., "NPTIC") in response to comments that a non-pneumatic tire should not be labeled with the size of the pneumatic tire it is intended to replace, but should be labeled with other identifying information. In the section above about labeling requirements, the notice explains that the agency agrees with the commenters that the NPTIC would be in the interests of safety. The reader should refer to that section for a more extensive discussion of this issue.

As discussed earlier, the terms "rim" and "test rim" have been changed to "non-pneumatic rim" and "non-pneumatic test rim." This will help distinguish between rims used with pneumatic tires and those used with non-pneumatic tires. Corresponding changes have been made throughout the regulatory text.

Performance Requirements and Testing Procedures in Standard No. 129

General Considerations

The NPRM proposed certain performance requirements and testing procedures for non-pneumatic tires. In developing a proposed standard for non-pneumatic tires, the agency reviewed the petition, the docket comments responding to the agency's request for comments, and the purpose for and mechanics of the requirements and tests for pneumatic tires in Standard No. 109. As a result of this analysis, the agency proposed the following requirements which it believed would ensure the safety of non-pneumatic tires. These included a lateral strength requirement instead of Standard No. 109's bead unseating requirement; and requirements for strength (in vertical loading), tire endurance, and high speed performance with modifications to take into account a non-pneumatic tire's lack of air pressure. The agency also proposed requirements related to the non-pneumatic tire assembly's size and construction, load rating, and a tread wear indicator. NHTSA tentatively concluded that the lateral strength, strength (in vertical loading), endurance, and high speed requirements would assure the structural integrity and durability of a non-pneumatic tire. The agency further believed that these performance requirements together with the proposed labeling requirements explaining that a non-pneumatic tire should be used only as a temporary spare tire and at limited speeds would assure their safety. Therefore, it decided not to propose additional tests beyond those equivalent to the ones in Standard No. 109. The agency's consideration of comments addressing these factors will be discussed separately.

Lateral Strength Performance Requirements

Section S4.2.2.3 of Standard No. 129 proposed requirements related to the lateral strength of a non-pneumatic tire. Such a tire would be required to show no visual evidence of tread or carcass separation, cracking, or chunking at forces comparable to those specified in Standard No. 109's bead unseating test for compact temporary pneumatic tires. The agency explained that the bead unseating test is intended, in part, to evaluate the loss of air of a tubeless pneumatic tire. In that regard, it would not be helpful in evaluating the lateral strength of a non-pneumatic tire. Nevertheless, because the bead unseating test also evaluates a pneumatic tire's resistance to lateral forces, the agency believed that a comparable test for non-pneumatic tires would be beneficial in determining their structural integrity.

The NPRM explained that GM, in its petition, recommended adopting the same test device used in the bead unseating test of pneumatic tires in Standard No. 109. The agency rejected this recommended test fixture because the unseating "blocks" might be inappropriate for other non-pneumatic tire designs and thus would be too specific to be included in a generic standard. Instead, the agency proposed a lateral strength test device that it believed was generic and appropriate for any anticipated non-pneumatic tire design. The proposed test block was patterned after a standard barrier type curb defined by the American Association of State Highway and Transportation Officials (AASHTO) in its publication, "A Policy on Geometric Design of Highways and Streets—1984." The proposed test was intended to evaluate the strength of a non-pneumatic tire in response to loads that would result from contact with a curb or similar road feature. The agency sought comments concerning the design of the proposed test device, test procedure, and performance requirements intended to evaluate the lateral strength of non-pneumatic tires.

Goodyear requested that the non-pneumatic tires not be subject to a lateral strength test, claiming that such a test was unnecessary and inappropriate. It also claimed that the intent of Standard No. 109's bead unseating test is solely "air retention," as evidenced by its application to tubeless but not tubed pneumatic tires.

NHTSA disagrees with Goodyear's comments and believes that the lateral strength requirement will effectively measure a non-pneumatic tire's resistance to lateral loads. The agency believes that this test will also help evaluate the possibility of the tire's separation from the rim or wheel center mem-

ber or the tire's "cracking," "chunking," or similar damage. The agency notes that the reason that Standard No. 109's bead unseating test is applied to tubeless tires only is because that failure mode is unique to tubeless pneumatic tires. Thus, its application to tubed pneumatic tires would be unnecessary and inappropriate.

Uniroyal, RMA, and Firestone each recommended that the lateral test force block be made lighter and smaller to make testing easier and safer. The lateral force test block shown in Figure 2 and referenced in S5.2, would have weighed 120 pounds and have been 6.5 inches in height, 14 inches in depth and 18 inches in width. Uniroyal commented that the block's depth could be reduced by 7 inches which would reduce the block's weight by over 50 percent. Firestone stated that the width should be retained to ensure that the test block would envelop the side wall of each tire.

After reviewing these comments, NHTSA believes that the test block size can be reduced to facilitate testing without adversely affecting the test procedure's effectiveness. In particular, the agency is adopting Uniroyal's recommendation to reduce the depth by 7 inches by removing 3½ inches from each end of the block and to reduce the height by removing one inch from the bottom of the block. After reviewing Firestone's concerns about the block's "envelopment" of a non-pneumatic spare tire, the agency concludes that it is necessary to widen the test block to 23 inches. The agency calculates that these changes will reduce the test block's weight to approximately 55 pounds, a 53 percent reduction.

Section S5.2 of the NPRM also proposed test requirements related to a non-pneumatic tire's lateral strength. Section S5.2.2.1 specified distances between the test block and the tire being tested. Uniroyal recommended that the agency add another distance expressed as "B = A − 1," explaining that without this modification certain tires would not pass the proposed requirement due to immediate contact with the wheel rim or other member. Thus, in anticipation of future non-pneumatic tire designs with a section height of less than 2 inches above the wheel rim or center member, the agency is including the additional distance requested by Uniroyal.

Vertical Strength Requirements

NHTSA proposed a strength test in S5.3 of Standard No. 129 that was intended to measure the tire's ability to resist concentrated vertical loads. The proposed test would have required a cylindrical steel plunger to be forced into the non-pneumatic tire at a rate of two inches per minute. The tester would then have evaluated the breaking energy for each test point in terms of inch pounds.

In the NPRM, the agency considered also proposing a "cleat" test, like the one suggested in GM's petition, which would have required a non-pneumatic tire to withstand a load exerted by a "cleat." This "cleat" would be ½ inch thick with the edge, that is forced against the tread of the non-pneumatic tire, rounded with ¼ inch radius, and the "cleat" would be one inch wider than the non-pneumatic tire's tread width. The agency tentatively rejected the cleat device because it believed that the plunger test would better simulate real world hazards and because the petitioner did not provide sufficient documentation in support of its test device. The agency expressly requested comments on both the plunger test and the cleat test.

Goodyear provided extensive comments in opposition to any vertical strength test requirement. It argued that the main concern addressed by the "tire strength" requirement in Standard No. 109 is puncture resistance (i.e., the integrity of the air chamber in resistance to vertical forces exerted by nails and similar penetrating objects). It believed that such a concern was not applicable to a non-pneumatic tire. Alternatively, Goodyear stated that if a strength test were deemed necessary, then GM's cleat test would be more appropriate because it evaluates a non-pneumatic tire's capability to withstand loading from curbs, potholes, or railroad tracks. While Uniroyal, RMA, Firestone, and GM also stated that the cleat test would be superior to a plunger test, no commenter supported the plunger test.

NHTSA continues to believe that a vertical strength test is necessary to evaluate a non-pneumatic tire's structural integrity. However, after reevaluating the proposal in light of the comments, the agency agrees that a cleat test, similar to the one requested in GM's petition, would better evaluate the real world problems that will most likely cause a non-pneumatic tire to experience a structural failure.

The agency notes that the plunger test used in Standard No. 109 is well suited for evaluating the energy absorbing capability and structural integrity of a pneumatic tire under conditions of maximum deformation. The plunger pushing against the center of the pneumatic tire's tread will deflect the tire to the maximum extent possible before forcing the tire against the rim. However, the cleat test would be inapplicable for a pneumatic tire which would experience a "pneumatic" failure when the tire's sidewall would be pinched against the rim flanges, long before the energy absorbing capability or structural integrity of the tire could be tested adequately.

In contrast, the situation is reversed for non-pneumatic tires. The "concentrated" type of load used in the plunger test could lead to a "puncture" (i.e., penetration by the plunger) of a non-pneumatic tire, but would not lead to a "pneumatic" failure. For

instance, Uniroyal, stated that its non-pneumatic tire continued to perform without any problems after it was "punctured" by several nails. The agency further notes that there is nothing inherent in a non-pneumatic tire's design that would be expected to lead to failure as the result of a particular type of impact. Based on these considerations, the agency believes that a cleat test that places stress on the entire cross section of a non-pneumatic tire appears to better address real world hazards to which such tires would be vulnerable than would a plunger type test.

As for the measurement of a non-pneumatic tire's strength, NHTSA believes that such a tire should be capable of absorbing energy at a level comparable to the pneumatic temporary tires that it is intended to replace. The NPRM proposed in S4.2.2.4 that the appropriate minimum breaking energy would be 1,950 inch pounds for tires with load ratings below 880 pounds and 2,600 inch pounds for tires with load ratings 880 pounds or above.

Uniroyal recommended that S4.2.2.4 be amended so that the minimum breaking energy would be 525 inch pounds for tires with load ratings below 880 pounds and 700 inch pounds for load ratings of 880 pounds or above. After reviewing Uniroyal's extensive comments in support of the reduced energy levels, NHTSA still believes that the proposed levels are appropriate to ensure a non-pneumatic tire's ability to withstand road hazards. The agency notes that the proposed energy levels are more comparable to the energy levels that a pneumatic temporary spare tire is required to withstand. Given the agency's belief that it is appropriate to require the non-pneumatic tires to be capable of absorbing energy at a level comparable to the pneumatic temporary spare tires that they are intended to replace, the agency has decided to adopt the energy levels as proposed rather than to adopt Uniroyal's suggested energy levels. The agency's review of Uniroyal's data further indicates that the higher energy levels will better protect against real world hazards.

After reviewing S4.2.2.4, NHTSA has decided to modify its language related to a non-pneumatic tire's failure. As proposed, this section stated "Each tire shall meet the requirements for minimum breaking energy when tested in accordance with S5.3 to the strength requirements . . . ." Because a non-pneumatic tire is unlikely to "break," the agency has decided to adopt the statement in the petition and express the requirement in terms of "no visual evidence of tread or carcass separation, cracking or chunking." The agency notes that this will be consistent with the requirements for lateral strength, tire endurance, and high speed performance, which are all expressed in this manner. As a result, the title of the table "Breaking Energy" will be changed to "Minimum Energy Level."

Other Performance Requirements

The NPRM proposed requirements for tire endurance in section S4.2.2.5 and high speed performance in Section S4.2.2.6. The proposals, which were patterned after the requirements in Standard No. 109, were intended to determine the structural integrity and durability of the tire under accelerated laboratory conditions. The agency received no comments about these tests and has decided to adopt them as proposed.

In the NPRM, the agency decided not to propose additional performance requirements explaining its tentative conclusion that the proposed requirements together with the labeling requirements would be adequate to ensure motor vehicle safety. In response to the 1987 request for comments, commenters who expressed an opinion on the matter all stated that no additional performance requirements were necessary. Similarly, in response to the NPRM, no commenter recommended requiring additional performance requirements. After reviewing the matter, the agency is reaffirming its tentative conclusion that the performance requirements, as proposed, together with the labeling requirements, will ensure safety and thus is not requiring any additional performance requirements.

Labeling Requirements in Standard 129

As explained earlier in this notice, the agency is adopting new labeling requirements in S6 of Standard No. 110 and S8 of Standard No. 120. The reader should refer to the discussions in earlier sections of this notice about such issues as a label's permanency, information to be provided about the tire's temporary use and maximum speed, and the tire size labeling/non-pneumatic tire identification code.

In addition to those requirements, the NPRM proposed certain other labeling requirements for non-pneumatic tires. Most of these proposed requirements were patterned after the labeling requirements set forth in section S4.3 of Standard No. 109 for size designation, load rating, rim size and type designation, manufacturer or brand name, certification, and tire identification number.

GM requested that a load rating not be required on a non-pneumatic tire, claiming this information might cause a motorist to use a non-pneumatic spare tire that would be inappropriate for a vehicle. The agency disagrees with the comment, noting that a tire's load rating is a straightforward item of information that has been required on pneumatic tires without confusing consumers. The agency believes this information is necessary for safety because some vehicle owners have been known to increase a

vehicle's load capacity by the addition of "helper springs" or "air shocks" to permit the towing of a trailer. Thus, by not requiring load rating information, the agency would increase the potential for a motorist to unknowingly use a vehicle equipped with the non-pneumatic tire in an unsafe manner.

Uniroyal commented that S4.3(f), which proposed requiring labeling with Part 574's tire identification number, should be amended given that that number refers, in part, to tire size. As the agency noted above in its discussion of tire size designations and the NPTIC, it believes that use of the NPTIC is preferable to use of tire size. While the agency agrees that a change is therefore necessary to reflect the NPTIC, it has decided to accomplish this by amending Part 574 to apply to non-pneumatic spare tire assemblies and by amending 574.5(b) to expressly refer to the NPTIC. Section 574.4, "applicability," and 574.6, "identification mark," are also revised to expressly refer to non-pneumatic tires and tire assemblies.

Tire and Rim/Wheel Center Member Matching Information

Section S4.4 proposed that each manufacturer list information about the rim or wheel center member expected to be used with a non-pneumatic tire. The information would be provided to either NHTSA or a tire and rim standardization organization such as The Tire and Rim Association. The proposal, which was patterned after section S4.4 of Standard No. 109 for pneumatic tires, is intended to ensure the dissemination of information about the proper use of non-pneumatic tires with rims.

Uniroyal recommended changing the first sentence of S4.4 to exempt from the section's requirements, a non-pneumatic spare tire that is an integral part of a non-pneumatic spare tire assembly. The agency agrees that such an exemption is appropriate given that the section's purpose is to provide information about the matching of non-integral tires and rims.

GM suggested adding a provision which would allow the required information to be disseminated by inclusion in the "vehicle manufacturer's service parts publications for the vehicle on which it is to be used." The commenter believed this change would help prevent the agency and manufacturers from being "deluged" with descriptions of non-pneumatic rims and wheel center members. Based on its experience with pneumatic tires, NHTSA has decided to reject GM's suggestion because the proposed requirement, i.e., the submission of this information to the agency or through the industry's standardization organizations, will be a more effective way to disseminate this information.

After reviewing this provision, NHTSA has decided to modify S4.4. to require the submission to include the NPTIC. This modification to require the inclusion of the NPTIC rather than the tire size is a conforming change made to reflect another change addressed earlier in the notice. In addition, the agency notes that it proposed in the definition of "test rim" in S3 to require each tire and rim matching information listing to include the load rating. After further review, the agency has determined that it more appropriate to include this requirement in section S4.4.

IV. *Effective Date*

The NPRM stated that the proposal would become effective 180 days after publication of a final rule in the *Federal Register*. Uniroyal commented that such advance notification is associated with revisions of regulations that affect products already in the marketplace to afford manufacturers time to comply with the changes. Uniroyal then requested that the 180 day period be eliminated or substantially reduced.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. After reviewing the request, NHTSA agrees that there is "good cause" not to require the full 180 day leadin period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers and that the public interest will be served by not delaying the introduction of these alternative tire designs. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, the agency is amending Standard No. 110, *Tire Selection and Rims,* and Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars,* and is establishing Standard No. 129, *New Non-Pneumatic Tires for Passenger Cars,* in Title 49 of the Code of Federal Regulations at Part 571 as follows:

§571.110 [Amended]

1. Paragraph S2 of Standard 110 is revised to read as follows:

S2 *Application.* This standard applies to passenger cars and to non-pneumatic spare tire assemblies for use on passenger cars.

2. Paragraph S3 of Standard No. 110 is amended by adding the following definitions in the proper alphabetical location:

"Non-pneumatic rim" is used as defined in §571.129.

"Non-pneumatic spare tire assembly" means a

non-pneumatic tire assembly intended for temporary use in place of one of the pneumatic tires and rims that are fitted to a passenger car in compliance with the requirements of this standard.

"Non-pneumatic tire" and "non-pneumatic tire assembly" are used as defined in §571.129.

"Rim" is used as defined in §571.109.

"Wheel center member" is used as defined in §571.129.

* * * * *

3. Paragraph S4.1 of Standard No. 110 is revised to read as follows:

S4.1 *General.* Passenger cars shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* except that passenger cars may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars* and S6 and S8 of this standard. Passenger cars equipped with such an assembly shall meet the requirements of S4.3(e), S5, and S7 of this standard.

* * * * *

4. Paragraph S4.3(c), (d), and (e) is revised to read as follows:

* * * * *

(c) Vehicle manufacturer's recommended cold tire inflation pressure for maximum loaded vehicle weight and, subject to the limitations of S4.3.1, for any other manufacturer-specified vehicle loading condition;

(d) Vehicle manufacturer's recommended tire size designation; and

(e) For a vehicle equipped with a non-pneumatic spare tire assembly, the non-pneumatic tire identification code with which that assembly is labeled pursuant to the requirements of S4.3(a) of §571.129, *New Non-Pneumatic Tires for Passenger Cars.*

* * * * *

5. Standard No. 110 is amended by adding paragraphs S5, S6, S7 and S8 to read as follows:

S5 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S6 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.*

Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S7 *Requirements for Passenger Cars Equipped with Non-Pneumatic Spare Tire Assemblies.*

S7.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the vehicle trunk lid or an equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S6 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S7.2 *Supplementary Information.* The owner's manual of the passenger car shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S6(a) and (b) and in S4.3(e);

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the passenger car is not recommended with more than one non-pneumatic spare tire in use at the same time.

S8 *Non-Pneumatic Rims and Wheel Center Members*

S8.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

S8.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

§571.120 [Amended]

6. Paragraph S3 of Standard 120 is revised to read as follows:

S3 *Application.* This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, to rims for use on those vehicles, and to non-pneumatic spare tire assemblies for use on those vehicles.

* * * * *

7. Paragraph S5.1.1 of Standard No. 120 is revised to read as follows:

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of §571.109, *New Pneumatic Tires—Passenger Cars,* or §571.119, *New Pneumatic Tires for Vehicles Other than Passenger Cars,* and rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 with §571.109, or S5.1 of §571.119, as applicable, except that vehicles may be equipped with a non-pneumatic spare tire assembly that meets the requirements of §571.129, *New Non-Pneumatic Tires for Passenger Cars,* and S8 and S10 of this standard. Vehicles equipped with such an assembly shall meet the requirements of S5.3.6, S7, and S9 of this standard.

8. The introductory text of paragraph S5.3.2 of Standard No. 120 is revised to read as follows:

S5.3.2 *Vehicles Manufactured on or after December 1, 1984.* Each vehicle manufactured on or after December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5, and in the case of a vehicle equipped with a non-pneumatic spare tire, also that specified in S5.3.6, in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

* * * * *

9. Paragraph S5.3.6 is added to Standard No. 120 to read as follows:

S5.3.6 The non-pneumatic tire identification code, with which that assembly is labeled pursuant to S4.3(a) of §571.129.

10. Standard 120 is amended by adding paragraphs S7, S8, S9, and S10.

S7 *Load Limits for Non-Pneumatic Spare Tires.* The highest vehicle maximum load on the tire for the vehicle shall not be greater than the load rating for the non-pneumatic spare tire.

S8 *Labeling Requirements for Non-Pneumatic Spare Tires or Tire Assemblies.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides in letters or numerals not less than 0.156 inches high, the information specified in paragraphs S6.(a) through (b). Except, in the case of a non-pneumatic tire assembly which has a particular side that must always face outward when mounted on a vehicle, the information shown in paragraphs S6(a) through (b) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in this standard or in Standard No. 129.

(a) FOR TEMPORARY USE ONLY; and

(b) MAXIMUM 50 M.P.H.

S9 *Requirements for Vehicles Equipped with Non-Pneumatic Spare Tire Assemblies*

S9.1 *Vehicle Placarding Requirements.* A placard, permanently affixed to the inside of the spare tire stowage area or equally accessible location adjacent to the non-pneumatic spare tire assembly, shall display the information set forth in S8 in block capitals and numerals not less than 0.25 inches high preceded by the words "IMPORTANT—USE OF SPARE TIRE" in letters not less than 0.375 inches high.

S9.2 *Supplementary Information.* The owner's manual of the vehicle shall contain, in writing in the English language and in not less than 10 point type, the following information under the heading "IMPORTANT—USE OF SPARE TIRE":

(a) A statement indicating the labeling related to appropriate use for the non-pneumatic spare tire including at a minimum the information set forth in S8(a) and (b) and in S5.3.6;

(b) An instruction to drive carefully when the non-pneumatic spare tire is in use, and to install the proper pneumatic tire and rim at the first reasonable opportunity; and

(c) A statement that operation of the vehicle is not recommended with more than one non-pneumatic spare tire in use at the same time.

S10 *Non-Pneumatic Rims and Wheel Center Members*

S10.1 *Non-Pneumatic Rim Requirements.* Each non-pneumatic rim that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a non-pneumatic rim that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-

pneumatic tire identification code, with which the vehicle is equipped.

S10.2 *Wheel Center Member Requirements.* Each wheel center member that is part of a separable non-pneumatic spare tire assembly shall be constructed to the dimensions of a wheel center member that is listed pursuant to S4.4 of §571.129 for use with the non-pneumatic tire, designated by its non-pneumatic tire identification code, with which the vehicle is equipped.

* * * * *

11. Part 571 is amended by the addition of 49 CFR §571.129 which would read as follows:

§571.129 Standard No. 129; *New Non-Pneumatic Tires for Passenger Cars.*

S1 *Scope.* This standard specifies tire dimensions and laboratory test requirements for lateral strength, strength, endurance, and high speed performance; defines the tire load rating; and specifies labeling requirements for non-pneumatic spare tires.

S2 *Application.* This standard applies to new temporary spare non-pneumatic tires for use on passenger cars.

S3 *Definitions.*

"Carcass" means the tire structure except for the tread which provides the major portion of the tire's capability to deflect in response to the vertical loads and tractive forces that the tire transmits from the roadway to the non-pneumatic rim, the wheel center member, or the vehicle and which attaches to the vehicle or attaches, either integrally or separably, to the wheel center member or non-pneumatic rim.

"Carcass separation" means the pulling away of the carcass from the non-pneumatic rim or wheel center member.

"Chunking" means the breaking away of pieces of the carcass or tread.

"Cracking" means any parting within the carcass, tread, or any components that connect the tire to the non-pneumatic rim or wheel center member and, if the non-pneumatic tire is integral with the non-pneumatic rim or wheel center member, any parting within the non-pneumatic rim, or wheel center member.

"Load rating" means the maximum load a tire is rated to carry.

"Maximum tire width" means the greater of either the linear distance between the exterior edges of the carcass or the linear distance between the exterior edges of the tread, both being measured parallel to the rolling axis of the tire.

"Non-pneumatic rim" means a mechanical device which, when a non-pneumatic tire assembly incorporates a wheel, supports the tire, and attaches, either integrally or separably, to the wheel center member and upon which the tire is attached.

"Non-pneumatic test rim" means, with reference to a tire to be tested, any non-pneumatic rim that is listed as appropriate for use with that tire in accordance with S4.4.

"Non-pneumatic tire" means a mechanical device which transmits, either directly or through a wheel or wheel center member, the vertical load and tractive forces from the roadway to the vehicle, generates the tractive forces that provide the directional control of the vehicle, and does not rely on the containment of any gas or fluid for providing those functions.

"Non-pneumatic tire assembly" means a non-pneumatic tire, alone or in combination with a wheel or wheel center member, which can be mounted on a vehicle.

"Non-pneumatic tire identification code" means an alphanumeric code that is assigned by the manufacturer to identify the tire with regard to its size, application to a specific non-pneumatic rim or wheel center member, or application to a specific vehicle.

"Test wheel center member" means, with reference to a tire to be tested, any wheel center member that is listed as appropriate for use with that tire in accordance with S4.4.

"Tread" means that portion of the tire that comes in contact with the road.

"Tread separation" means the pulling away of the tread from the carcass.

"Wheel" means a mechanical device which consists of a non-pneumatic rim and wheel center member and which, in the case of a non-pneumatic tire assembly incorporating a wheel, provides the connection between the tire and the vehicle.

"Wheel center member" means, in the case of a non-pneumatic tire assembly incorporating a wheel, a mechanical device which attaches, either integrally or separably, to the non-pneumatic rim and provides the connection between the non-pneumatic rim and the vehicle.

S4 *Requirements.*

S4.1 *Size and Construction.* Each tire shall be designed to fit each non-pneumatic rim or wheel center member specified for its non-pneumatic tire identification code designation in a listing in accordance with section S4.4.

S4.2 *Performance Requirements*

S4.2.1 *General.* Each tire shall conform to the following:

(a) Its load rating shall be that specified in a submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for its non-pneumatic tire identification code designation.

(b) It shall incorporate a tread wear indicator that

will provide a visual indication that the tire has worn to a tread depth of $\frac{1}{16}$ inch.

(c) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high speed performance procedure specified in S5.5, exhibit no visual evidence of tread or carcass separation, chunking or cracking.

(d) It shall meet the requirements of S4.2.2.5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 tires.

S4.2.2 *Test Requirements.*

S4.2.2.1 *Test Sample.* For each test sample use:

(a) One tire for physical dimensions, lateral strength, and strength in sequence;

(b) A second tire for tire endurance; and

(c) A third tire for high speed performance.

S4.2.2.2 *Physical Dimensions.* For a non-pneumatic tire assembly in which the tire is separable from the non-pneumatic rim or wheel center member, the dimensions, measured in accordance with S5.1, for that portion of the tire that attaches to that non-pneumatic rim or wheel center member shall satisfy the dimensional specifications contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S4.2.2.3. *Lateral Strength.* There shall be no visual evidence of tread or carcass separation, cracking or chunking, when a tire is tested in accordance with S5.2 to a load of:

(a) 1,500 pounds for tires with a load rating less than 880 pounds;

(b) 2,000 pounds for tires with a load rating of 880 pounds or more but less than 1,400 pounds.

(c) 2,500 pounds for tires with a load rating of 1,400 pounds or more, using the load rating marked on the tire or tire assembly.

S4.2.2.4 *Tire Strength.* There shall be no visual evidence of tread carcass separation, cracking or chunking, when a tire is tested in accordance with S5.3 to a minimum energy level of:

Load Rating	*Minimum Energy Level*
Below 880 pounds	1,950 inch pounds
880 pounds and above	2,600 inch pounds

S4.2.2.5 *Tire Endurance.* When the tire has been subjected to the laboratory endurance test specified in S5.4, using, if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.2.2.6 *High Speed Performance.* When the tire has been subjected to the laboratory high speed performance test specified in S5.5, using if applicable, a non-pneumatic test rim or test wheel center member that undergoes no permanent deformation, there shall be no visual evidence of tread or carcass separation, cracking or chunking. In the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, the assembly shall undergo no permanent deformation with the exception of wear of the tread.

S4.3 *Labeling Requirements.* Each non-pneumatic tire or, in the case of a non-pneumatic tire assembly in which the non-pneumatic tire is an integral part of the assembly, each non-pneumatic tire assembly shall be permanently molded, stamped, or otherwise permanently marked into or onto both sides of the tire or tire assembly in letters or numerals not less than 0.078 inches high, the information shown in paragraphs S4.3(a) through (f). Except, in the case of a non-pneumatic tire assembly of which one side always must face outward when mounted on a vehicle, the information shown in paragraphs S4.3(a) through (f) shall only be required on the outward facing side. The information shall be positioned on the tire or tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of any non-pneumatic rim or wheel center member designated for use with that tire in S4.4 of this standard or in 49 CFR §571.110 or 49 CFR §571.120.

(a) The non-pneumatic tire identification code.

(b) Load rating, which, if expressed in kilograms, shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole pound;

(c) For a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly, the size and type designation of the non-pneumatic rim or wheel tire assembly that is contained in the submission made by a manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation;

(d) The name of the manufacturer or brand name;

(e) The symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(f) The tire identification number required by §574.5 of this chapter;

(g) The labeling requirements set forth in S6 of Standard No. 110 (§571.110), or S8 of Standard No. 120 (§571.120).

S4.4 *Non-Pneumatic Tire Identification Code and Non-Pneumatic Rim/Wheel Center Member Matching Information.* For purposes of this standard, S8 of 49 CFR 571.110 and S10 of 49 CFR 571.120, each manufacturer of a non-pneumatic tire that is not an integral part of a non-pneumatic tire assembly shall ensure that it provides a listing to the public for each non-pneumatic tire that it produces. The listing shall include the non-pneumatic tire identification code, tire load rating, dimensional specifications and a diagram of the portion of the tire that attaches to the non-pneumatic rim or wheel center member, and a list of the non-pneumatic rims or wheel center members that may be used with that tire. For each non-pneumatic rim or wheel center member included in such a listing, the information provided shall include a size and type designation for the non-pneumatic rim or wheel center member, and dimensional specifications and a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of the non-pneumatic rim or portion of the wheel center member that attaches to the tire if the non-pneumatic rim's or portion of the wheel center member's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b) of this section. The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires or, in the case of non-pneumatic tires supplied only as a temporary spare tire on a vehicle, in a document furnished to dealers of vehicles equipped with the tires, to any person upon request, and in duplicate to the Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, or at least one of the following organizations:

The Tire and Rim Association

The European Tire and Rim Technical Organization

Japan Automobile Tire Manufacturers' Association, Inc.

Deutsche Industrie Norm

British Standards Institute

Scandinavian Tire and Rim Organization

Tyre and Rim Association of Australia

S5 *Test Procedures.*

S5.1 *Physical Dimensions.* After conditioning the tire at room temperature for at least 24 hours, using equipment with minimum measurement capabilities of one-half the smallest tolerance specified in the listing contained in the submission made by a manufacturer pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation, measure the portion of the tire that attaches to the non-pneumatic rim or the wheel center member. For any inner diameter dimensional specifications, or other dimensional specifications that are uniform or uniformly spaced around some circumference of the tire, these measurements shall be taken at least six points around the tire, or if specified, at the points specified in the listing contained in the submission made by an individual manufacturer, pursuant to S4.4(a), or in one of the publications described in S4.4(b) for that tire's non-pneumatic tire identification code designation.

S5.2 *Lateral Strength.*

S5.2.1 *Preparation of the tire.*

S5.2.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.2.1.2 Mount the tire assembly in a fixture as shown in Figure 1 with the surface of the tire assembly that would face outward when mounted on a vehicle facing toward the lateral strength test block shown in Figure 2 and force the lateral strength test block against the tire.

S5.2.2 *Test Procedure.*

S5.2.2.1 Apply a load through the block to the tire at a rate of 2 inches per minute, with the load arm parallel to the tire assembly at the time of engagement and the first point of contact with the test block being the test block centerline shown in Figure 2, at the following distances, B, in sequence, as shown in Figure 1:

B = A − 1 inch
B = A − 2 inches
B = A − 3 inches
B = A − 4 inches
B = A − 5 inches, and
B = A − 6 inches

However, if at any time during the conduct of the test, the test block comes in contact with the non-pneumatic test rim or test wheel center member, the test shall be suspended and no further testing at smaller values of the distance B shall be conducted. When tested to the above procedure, satisfying the requirements of S4.2.2.3 for all values of B greater than that for which contact between the non-pneumatic test rim or test wheel center member and the test block is made, shall constitute compliance to the requirements set forth in S4.2.2.3.

S5.3 *Tire Strength.*

S5.3.1 *Preparation of the Tire.*

S5.3.1.1 If applicable, mount the tire on a non-pneumatic test rim or test wheel center member.

S5.3.1.2 Condition the tire assembly at room temperature for at least three hours.

S5.3.2 *Test Procedures.*

S5.3.2.1 Force the test cleat, as defined in S5.3.2.2, with its length axis (see S5.3.2.2(a)) parallel to the rolling axis of the non-pneumatic tire assembly, and its height axis (see S5.3.2.2(c)), coinciding with a radius of the non-pneumatic tire assembly, into the tread of the tire at five test points equally spaced around the circumference of the tire. At each test point, the test cleat is forced into the tire at a rate of two inches per minute until the applicable minimum energy level, as shown in S4.2.2.4, calculated using the formula contained in S5.3.2.3, is reached.

S5.3.2.2 The test cleat is made of steel and has the following dimensions:

(a) Length of one inch greater than the maximum tire width of the tire.

(b) Width of one-half inch with the surface which contacts the tire's tread having one-quarter inch radius.

(c) Height of one inch greater than the difference between the unloaded radius of the non-pneumatic tire assembly and the minimum radius of the non-pneumatic rim or wheel center member, if used with the non-pneumatic tire assembly being tested.

S5.3.2.3 The energy level is calculated by the following formula:

$$E = \frac{F \times P}{2}$$

where

E = Energy level, inch-pounds;

F = Force, pounds; and

P = Penetration, inches

S5.4 *Tire Endurance.*

S5.4.1 *Preparation of the tire.*

S5.4.1.1 If applicable, mount a new tire on a non-pneumatic test rim or test wheel center member.

S5.4.1.2 Condition the tire assembly to 100 ± 5° F. for at least three hours.

S5.4.2 *Test Procedure.*

S5.4.2.1 Mount the tire assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the maximum tire width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's non-pneumatic tire identification code designation.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5° F.

S5.4.2.3 Conduct the test at 50 miles per hour (m.p.h.) in accordance with the following schedule without interruption (the loads for the following periods are the specified percentage of the load rating marked on the tire or tire assembly):

	Percent
4 hours	85
6 hours	90
24 hours	100

S5.4.2.4 Immediately after running the tire the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.5.

S5.5 *High Speed Endurance.*

S5.5.1 After preparing the tire in accordance with S5.4.1, if applicable, mount the tire assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's load rating as marked on the tire or tire assembly.

S5.5.2 Break in the tire by running it for 2 hours at 50 m.p.h.

S5.5.3 Allow to cool to 100 ± 5° F.

S5.5.4 Test at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and 85 m.p.h. for 30 minutes.

S5.5.5 Immediately after running the tire for the required time, allow the tire to cool for one hour, then, if applicable, detach it from the non-pneumatic test rim or test wheel center member, and inspect it for the conditions specified in S4.2.2.6.

S6 *Nonconforming tires.* Any non-pneumatic tire that is designed for use on passenger cars that does not conform to all the requirements of this standard, shall not be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose.

* * * * *

12. Figures 1 and 2 are added following the text of Standard No. 129, appearing as follows:

Part 574 [Amended]

13. The first sentence of 574.4 *Applicability* is revised to read as follows:

This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires, and new non-pneumatic tires and non-pneumatic tire assemblies for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948.

* * * * *

14. The first sentence of 574.5 *Tire identification requirements* is revised to read as follows:

Each tire manufacturer shall conspicuously label on one sidewall of each tire it manufactures, except tires manufactured exclusively for mileage-contract purchasers, or non-pneumatic tires or non-pneumatic tire assemblies, by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number

containing the information set forth in paragraphs (a) through (d) of this section.

* * * * *

15. Section 574.5 is amended by adding the following to the end of the opening paragraph:

* * * * *

Each manufacturer of a non-pneumatic tire or a non-pneumatic tire assembly shall permanently mold, stamp, or otherwise permanently mark into or onto one side of the non-pneumatic tire or non-pneumatic tire assembly a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by the Federal motor vehicle safety standards shall be positioned relative to the tire identification number as shown in Figure 1, and the symbols to be used for the other information are those listed above. The labeling for a non-pneumatic tire or a non-pneumatic tire assembly shall be in the manner specified in Figure 1 and positioned on the non-pneumatic tire or non-pneumatic tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of the non-pneumatic rim or wheel center member designated for use with that non-pneumatic tire in S4.4 of Standard No. 129 (49 CFR 571.129).

16. Section 574.5(b) is amended by adding the following after the opening sentence:

* * * * *

For a new non-pneumatic tire of a non-pneumatic tire assembly, the second group, of not more than two symbols, shall be used to identify the non-pneumatic tire identification code.

* * * * *

17. Section 574.6, *Identification Mark,* is revised to read as follows:

* * * * *

To obtain the identification mark required by 574.5(a), each manufacturer of new or retreaded pneumatic tires, non-pneumatic tires, or non-pneumatic tire assemblies shall apply in writing to "Tire Identification and Recordkeeping," National Highway Traffic Safety Administration, Department of Transportation, Washington, DC 20590, identify itself as a tire manufacturer or retreader and furnish the following information:

(a) The name, or other designation identifying the applicant, and its main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., pneumatic tires for passenger cars, buses, trucks, or motorcycles; pneumatic retreaded tires; or non-pneumatic tires or non-pneumatic tire assemblies.

Issued on July 12, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 29581
July 20, 1990

PART 574—TIRE IDENTIFICATION AND RECORDKEEPING

(Docket No. 70-12; Notice No. 5)

S574.1 Scope.

This part sets forth the method by which new tire manufacturers and new tire brand name owners shall identify tires for use on motor vehicles and maintain records of tire purchasers, and the method by which retreaders and retreaded tire brand name owners shall identify tires for use on motor vehicles. This part also sets forth the methods by which independent tire dealers and distributors shall record, on registration forms, their names and addresses and the identification number of the tires sold to tire purchasers and provid the forms to the purchasers, so that the purchasers may report their names to the new tire manufacturers and new tire brand name owners, and by which other tire dealers and distributors shall record and report the names of tire purchasers of the new tire manufacturers and new tire brand name owners.

S574.2 Purpose.

The purpose of this part is to facilitate notification to purchasers of defective or nonconforming tires, pursuant to sections 151 and 152 of the Nation Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1411 and 1412) (hereafter the Act), so that they may take appropriate action in the interest of motor vehicle safety.

S574.3 Definitions.

(a) *Statutory definitions.* All terms in this part that are defined in section 102 of the Act are used as defined therein.

(b) *Motor vehicle safety standard definitions.* Unless otherwise indicated, all terms used in this part that are defined in the Motor Vehicle Safety Standards, Part 571 of this subchapter (hereinafter the Standards), are used as defined therein.

(c) *Definitions use in this part.* (1) "Mileage contract purchaser" means a person who purchases or leases tire use on a mileage basis.

(2) "Independent" means, with respect to a tire distributor or dealer, one whose business is not owned or controlled by a tire manufacturer or brand name owner.

(3) "New tire brand name owner" means a person, other than a new tire manufacturer, who owns or has the right to control the brand name of a new tire or a person who licenses another to purchase new tires from a new manufacturer bearing the licensor's brand name.

(4) "Retreaded tire brand name owner" means a person, other than a retreader, who owns or has the right to control the brand name of a retreaded tire or a person who licenses another to purchase retreaded tires from a retreader bearing the licensor's brand name.

(5) "Tire purchaser" means a person who buys or leases a new tire, or who buys or leases for 60 days or more a motor vehicle containing a new tire for purposes other than resale.

S574.4. Applicability.

[This part applies to manufacturers, brand name owners, retreaders, distributors, and dealers of new and retreaded tires, and new non-pneumatic tires and non-pneumatic tire assemblies for use on motor vehicles manufactured after 1948 and to manufacturers and dealers of motor vehicles manufactured after 1948. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

However, it does not apply to persons who retread tires solely for their own use.

S574.5 Tire identification requirements.

Each tire manufacturer shall conspicuously label on one sidewall of each tire it manufacturers, except tires manufactured exclusively for mileage-contract purchasers, [or non-pneumatic tires on non-pneumatic tire assemblies] by permanently molding into or onto the sidewall, in the manner and location specified in Figure 1, a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. Each tire retreader, except tire retreaders who retread tires solely for their own use, shall conspicuously label one sidewall of each tire it retreads by permanently molding or branding into or onto the sidewall, in the manner and location specified in Figure 2, a tire identification number containing the information set forth in paragraph (a) through (d) of this section.

In addition, the DOT symbol required by Federal Motor Vehicle Safety Standards shall be located as shown in Figures 1 and 2. The DOT symbol shall not appear on tires to which no Federal Motor Vehicle Safety Standard is applicable, except that the DOT symbol on tires for use on motor vehicles other than passenger cars may, prior to retreading, be removed from the sidewall or allowed to remain on the sidewall, at the retreader's option. The symbols to be used in the tire identification number for tire manufacturers and retreaders, are: "A, B, C, D, E, F, H, J, K, L, M, N, P, R, T, U, V, W, X, Y, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0." Tires manufactured or retreaded exclusively for mileage-contract purchasers are not required to contain a tire identification number if the tire contains the phrase "for mileage contract use only" permanently molded into or onto the tire sidewall in lettering at least one-quarter inch high.

[Each manufacturer of a non-pneumatic tire or a non-pneumatic tire assembly shall permanently mold, stamp or otherwise permanently mark into or onto one side of the non-pneumatic tire or non-pneumatic tire assembly a tire identification number containing the information set forth in paragraphs (a) through (d) of this section. In addition, the DOT symbol required by the Federal motor vehicle safety standards shall be positioned relative to the tire identification number as shown in Figure 1, and the symbols to be used for the other information are those listed above. The labeling for a non-pneumatic tire or a non-pneumatic tire assembly shall be in the manner specified in Figure 1 and positioned on the non-pneumatic tire or non-pneumatic tire assembly such that it is not placed on the tread or the outermost edge of the tire and is not obstructed by any portion of the non-pneumatic rim or wheel center member designated for use with that non-pneumatic tire in S4.4 of Standard No. 129 (49 CFR 571.129). **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

(a) *First grouping.* The first group, of two or three symbols, depending on whether the tire is new or retreaded, shall represent the manufacturer's assigned identification mark (see §574.6).

(b) *Second grouping.* For new tires, the second group, of no more than two symbols, shall be used to identify the tire size. [For a new non-pneumatic tire of a non-pneumatic tire assembly, the second group, of not more than two symbols, shall be used to identify the non-pneumatic tire identification code.] For retreaded tires, the second group, of no more than two symbols, shall identify the retread matrix in which the tire was processed or a tire size code if a matrix was not used to process the retreaded tire. Each new tire manufacturer and retreaded shall maintain a record of each symbol used, with the corresponding matrix or tire size and shall provide such record to NHTSA upon written request. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

(c) *Third grouping.* The third group, consisting of no more than four symbols, may be used at the option of the manufacturer or retreader as a descriptive code for the purpose of identifying significant characteristics of the tire. However, if the tire is manufactured for a brand name owner, one of the functions of the third grouping shall be to identify the brand name owner. Each manufacturer or retreader who uses the third grouping shall maintain a detailed record of any descriptive or brand name owner code used, which shall be provided to the Bureau upon written request.

(d) *Fourth grouping.* The fourth group, of three symbols, shall identify the week and year of manufacture. The first two symbols shall identify the week of the year using "01" for the first full calendar week in each year. The final week of each year may include not more than 6 days of the following year. The third symbol shall identify the year. (Example: 311 means the 31st week of 1971, or Aug. 1 through 7, 1971; 012 means the first week of 1972, or Jan. 2 through 8, 1972.) The symbols signifying the date of manufacture shall immediately follow the optional descriptive code (paragraph (c) of this section). If no optional descriptive code is used the symbols signifying the date of manufacture shall be placed in the area shown in Figures 1 and 2 for the optional description code.

S574.6 Identification mark.

[To obtain the identification mark required by 574.5(a), each manufacturer of new or retreaded pneumatic tires, non-pneumatic tires or non-pneumatic tire assemblies shall apply in writing to "Tire Identification and Recordkeeping," National Highway Traffic Safety Administration, Department of Transportation, Washington, DC 20590, identify itself as a tire manufacturer or retreader and furnish the following information:

(a) The name, or other designation identifying the applicant, and its main office address.

(b) The name, or other identifying designation, of each individual plant operated by the manufacturer and the address of each plant, if applicable.

(c) The type of tires manufactured at each plant, e.g., pneumatic tire for passenger cars, buses, trucks or motorcycles; pneumatic retreaded tires; or non-pneumatic tires or non-pneumatic tire assemblies. **(55 F.R. 29581—July 20, 1990. Effective: August 20, 1990)**]

S574.7 Information requirements—new tire manufacturers, new tire brand name owners.

(a)(1) Each new tire manufacturer and each new tire brand name owner (hereinafter referred to in this section and §574.8 as "tire manufacturer") or its designee, shall provide tire registration forms to every distributor and dealer of its tire which offers new tires for sale or lease to tire purchasers.

(2) Each tire registration form provided to independent distributors and dealers pursuant to paragraph (a)(1) of this section shall contain space for recording the information specified in paragraphs (a)(4)(A) through (a)(4)(C) of this section and shall conform in content and format to Figures 3a and 3b. Each form shall be:

(a) Rectangular;

(b) Not less than .007 inches thick;

(c) Greater than 3½ inches, but not greater than 1/8 inches wide; and

(d) Greater than 5 inches, but not greater than 6 inches long.

(3) Each tire registration form provided to distributors and dealers, other than independent distributors and dealers, pursuant to paragraph (a)(1) of this section shall be similar in format and size for Figure 4 and shall contain space for recording the information specified in paragraphs (a)(4)(A) through (a)(4)(A) of this section.

(4)(A) Name and address of the tire purchaser.

(B) Tire identification number.

(C) Name and address of the tire seller or other means by which the tire manufacturer can identify the tire seller.

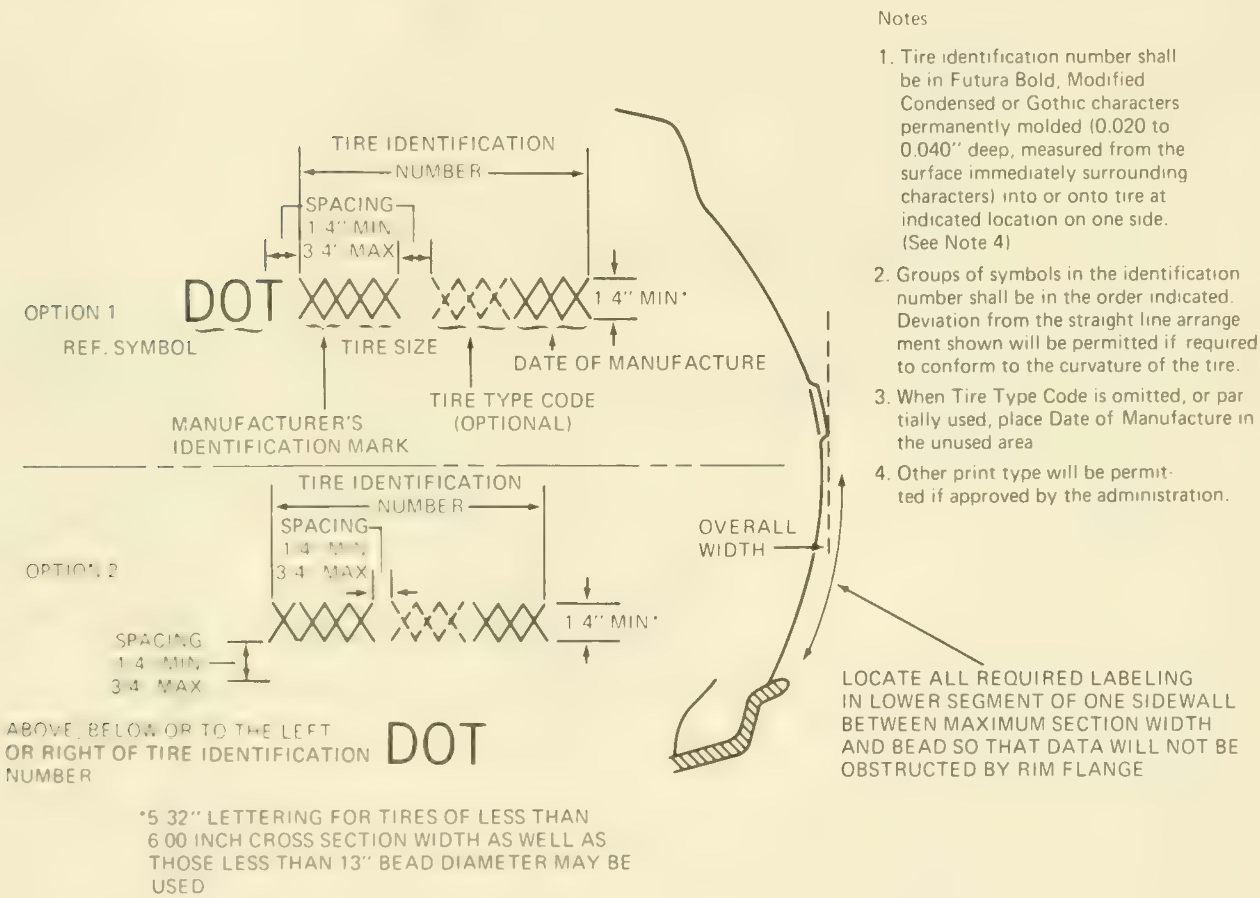
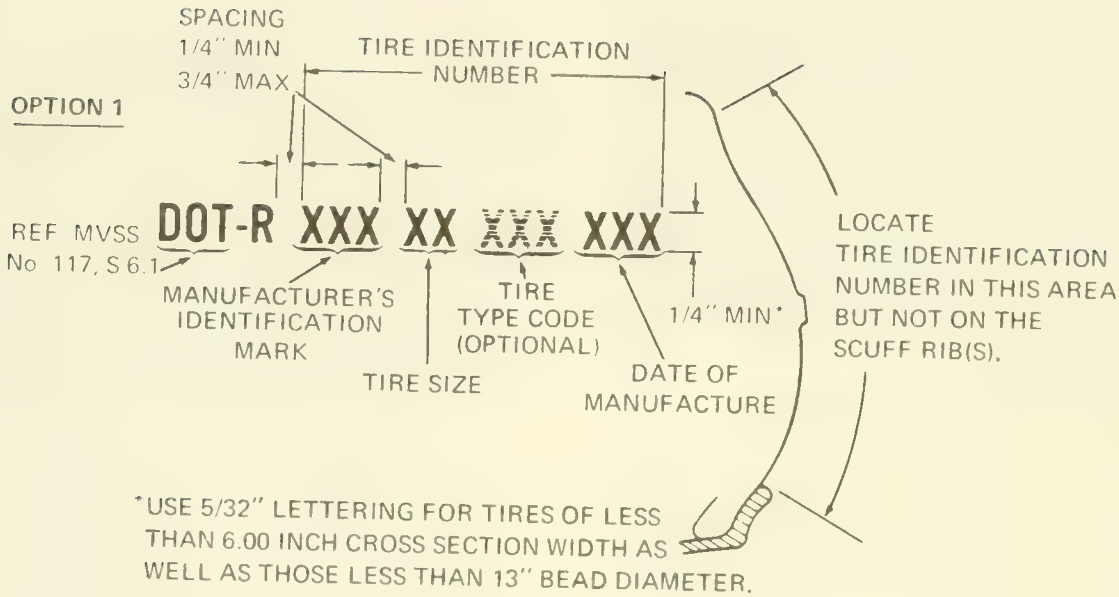
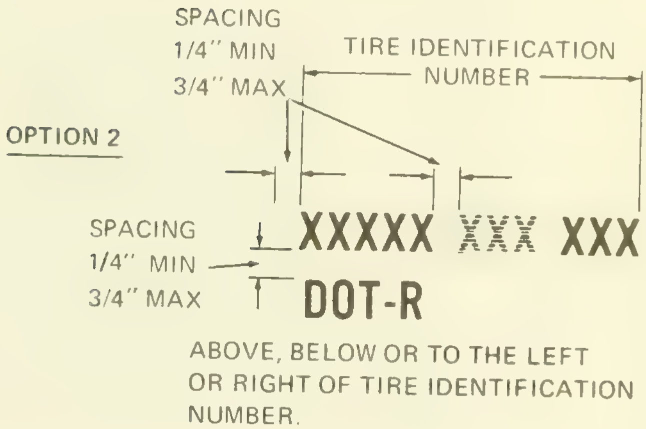


FIGURE 1—IDENTIFICATION NUMBER FOR NEW TIRES





NOTES:

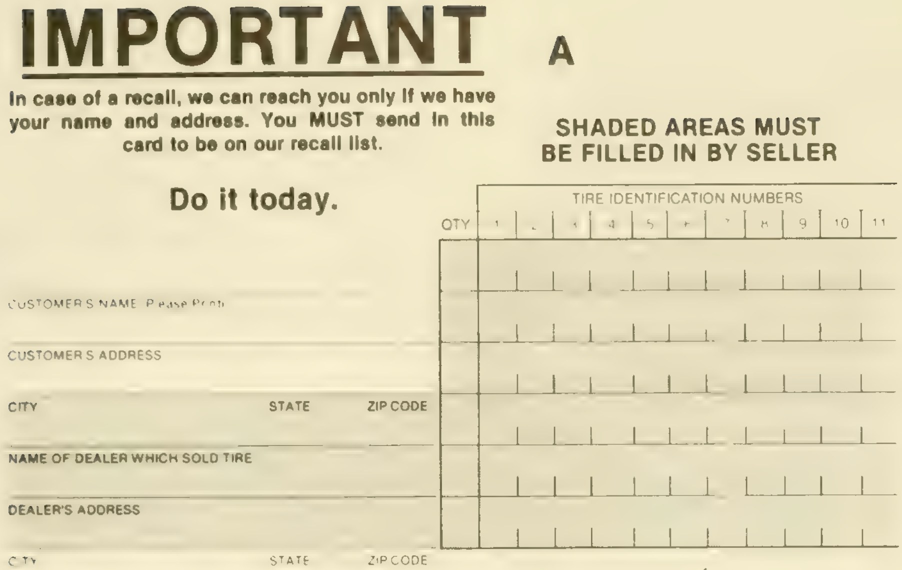
1. Tire identification number shall be in "Futura Bold, Modified, Condensed or Gothic" characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side. (See Note 4)

2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.

3. When Tire Type Code is omitted, or partially used, place Date of Manufacture in the unused area.

4. Other print type will be permitted if approved by the Administration.

FIGURE 2—IDENTIFICATION NUMBER FOR RETREADED TIRES



A Preprinted tire manufactturer's name—unless the manufacturer's name appears on reverse side of the form.

FIGURE 3a—REGISTRATION FORM FOR INDEPENDENT DISTRIBUTORS AND DEALERS—TIRE IDENTIFICATION NUMBER SIDE

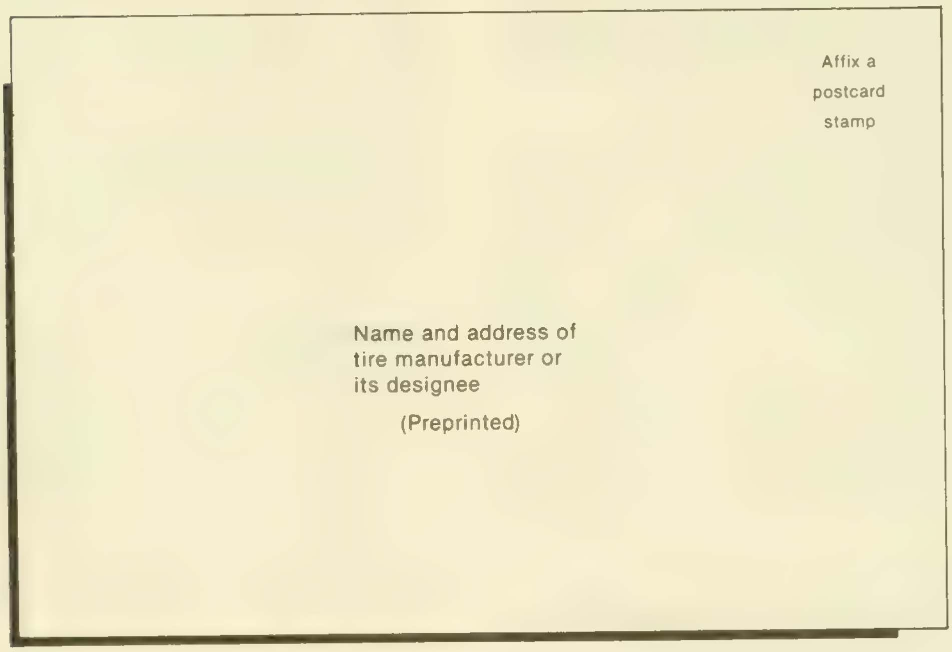


FIGURE 3b—REGISTRATION FORM FOR INDEPENDENT DISTRIBUTORS AND DEALERS—ADDRESS SIDE

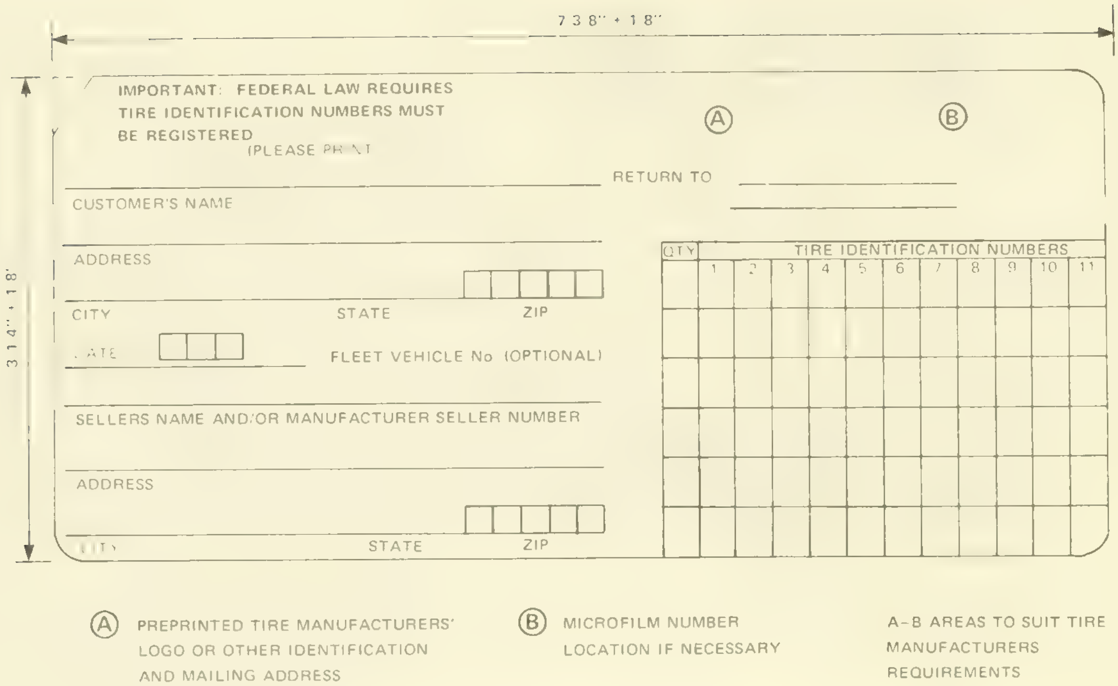


FIGURE 4a—UNIVERSAL FORMAT

(b) Each tire manufacturer shall record and maintain, or have recorded and maintained for it by a designee, the information from registration forms which are submitted to its or its designee. No tire manufacturer shall use the information on the registration forms for any commercial purpose detrimental to tire distributors and dealers. Any tire manufacturer to which registration forms are mistakenly sent shall forward those registration forms to the proper tire manufacturer within 90 days of the receipt of the forms.

(c) Each tire manufacturer shall maintain, or have maintained for it by a designee, a record of each tire distributor and dealer that purchases tires directly from the manufacturer and sells them to tire purchasers, the number of tires purchased by each such distributor or dealer, the number of tires for which reports have been received from each such distributor or dealer other than an independent distributor or dealer, the number of tires for which reports have been received from each such independent distributor or dealer, the total number of tires for which registration forms have been submitted to the manufacturer of its designee, and the total number of tires sold by the manufacturer.

(d) The information that is specified in paragraph (a)(4) of this section and recorded on registration forms submitted to a tire manufacturer or its designee shall be maintained for a period of not less than three years from the date on which the information is recorded by the manufacturer or its designee.

S574.8 Information requirements—tire distributors and dealers.

(a) *Independent distributors and dealers.* (1) Each independent distributor and each independent dealer selling or leasing new tire to tire purchasers or lessors (hereinafter referred to in this section as "tire purchasers") shall provide each tire purchaser at the time of sale or lease of the tire(s) with a tire registration form.

(2) The distributor or dealer may use either the registration forms provided by the tire manufacturers pursuant to §574.7(a) for forms provided by tire manufacturers to independent distributors and dealers.

(3) Before giving the registration form to the tire purchaser, the distributor or dealer shall record in the appropriate spaces provided on that form:

(A) The entire tire identification number of the tire(s) sold or leased to the tire purchaser; and

(B) The distributor's or dealer's name and address or other means of identification known to the tire manufacturer.

(4) Multiple tire purchases or leases by the same tire purchaser may be recorded on a single registration form.

(b) *Other distributors and dealers.* (1) Each distributor and each dealer, other than an independent distributor or dealer, selling new tires to tire purchasers

shall submit the information specified in §574.7(a) (4) to the manufacturer of the tires sold, or to its designee.

(2) Each tire distributor and each dealer, shall submit registration forms containing the information specified in §574.7(a)(4) to the tire manufacturer, or person maintaining the information, not less often than every 30 days. However, a distributor or dealer which sells less than 40 tires, of all makes, types and sizes during a 30-day period may wait until he or she sells a total of 40 new tires, but in not event longer than six months, before forwarding the tire information to the respective tire manufacturers or their designees.

(c) Each distributor and each dealer selling new tires to other tire distributors or dealers shall supply to the distributor or dealer a means to record the information specified in §574.7(a)(4), less such a means has been provided to that distributor or dealer by another person or by a manufacturer.

(d) Each distributor and each dealer shall imediately stop selling any group of tires when so directed by a notification issued pursuant to sections 151 and 152 of the Act (15 U.S.C. 1411 and 1412).

S574.9 Requirements for motor vehicle dealers.

(a) Each motor vehicle dealer who sells a used motor vehicle for purposes other than resale, or who leases a motor vehicle for more than 60 days, that is equipped with new tires or newly retreaded tires is considered, for purposes of this part, to be a tire dealer and shall meet the requirements specified in §574.8.

(b) Each person selling a new motor vehicle to first purchasers for purposes other than resale, that is equipped with tires that were not on the motor vehicle when shipped by the vehicle manufacturer is considered a tire dealer for purposes of this and shall meet the requirements specified in §574.8.

S574.10 Requirements for motor vehicle manufacturers.

Each motor vehicle manufacturer, or his designee, shall maintain a record of tires on or in each vehicle shipped by him to a motor vehicle distributor or dealer, and shall maintain a record of the name and address of the first purchaser for purposes other than resale of each vehicle equipped with such tires. These records shall be maintained for a period of not less than three years from the date of sale of the vehicle to the first purchaser for purposes other than resale.

Interpretation

Under section 113(f) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402(f) and Part 574, it is the tire manufacturer who has the ultimate responsibility for maintaining the records of first purchasers. Therefore, it is the tire manufacturer or his designee who must maintain these records. The term "designee," as used in the regulation, was not intended to preclude multiple designees; if the tire manufacturer desires, he may designate more than one person to maintain the required information. Furthermore, neither the Act nor the regulation prohibits the distributor or dealer from being the manufacturer's designee, nor do they prohibit a distributor or dealer from selecting someone to be the manufacturer's designee provided the manufacturer approves of the selection.

Whe respect to the possibility of manufacturers using the maintained information to the detriment of a distributor or dealer, NHTSA will of course investigate claims by distributors or dealers of alleged misconduct and, if the maintained information is being misused, take appropriate action.

36 F.R. 4783
March 12, 1971

36 F.R. 13757
July 24, 1971

36 F.R. 16510
August 21, 1971

PREAMBLE TO AN AMENDMENT TO PART 575

Consumer Information Regulations Uniform Tire Quality Grading Standards
(Docket No. 25; Notice 62)
RIN 2127-AB21

ACTION—Final Rule.

SUMMARY: The Uniform Tire Quality Grading Standards (UTQGS) require that manufacturers and brand name owners of passenger car tires provide consumers with information about the relative performance of a tire in terms of treadwear, traction, and temperature resistance. This notice amends the treadwear grading procedures by adopting four proposals that are intended to reduce the variability of the test results and simplify the calculations related to treadwear grades. First, the rule requires the wheel alignment of a test veh4cle to be set more precisely based on the vehicle manufacturer's alignment specifications. Second, the rule amends the requirements related to tire rotation so that each tire in a test convoy is driven on each wheel position on each vehicle for the same distance. Third, the rule permits the use of a simplified treadwear gradinig method so that tire tread depth measurements may be taken twice rather than nine times, rourth the rule replaces the previous practice of assigning grades in 10-point intervals to reflect the differences in treadwear with a new practice of assigning grades in 20-point intervals.

EFFECTIVE DATE: These amendments are December 15, 1990 except the amendment on the grading interval is effective one year after the publication of the final rule.

SUPPLEMENTARY INFORMATION:

I. Background Information

Section 203 of the National Traffic and Motor Vehicle Safety Act ("Vehicle Safety Act") requires the Secretary of Transportation to prescribe a "uniform quality grading system for motor vehicle tires." As explained in that section, the purpose of this system is to "assist the consumer to make an informed choice in the purchase of motor vehicle tires." The agency has specified these requirements in the Uniform Tire Quality Grading Standards (UTQGS) regulation (49 CFR § 575.104), which requires that manufacturers or brand name owners of passenger car tires provide consumers with information about their tires' relative performance in terms of treadwear, traction, and temperature resistance.

The primary purpose of the treadwear grades is to aid consumers in the selection of new tires by informing them of the relative amount of expected tread life for each tire offered for sale. This allows the tire purchaser to compare passenger car tires based on tread life. Although these treadwear grades are not intended to be used to predict the actual mileage that a particular tire will achieve, they must be reasonably accurate to help consumers predict the relative tread life.

The treadwear grades are based on the test results of tires traveling 6,400 miles over a single, predetermined course on public roads near San Angelo, Texas. These grades represent a comparative rating of treadwear on tested tires. For example, a tire graded 180 would last one and a half times as long on the government course as a tire graded 120. The relative performance of tires, however, depends on the actual conditions of their use and may depart significantly from the norm due to variations in driving habits, service practices, and differences in road characteristics and climate.

Since the treadwear upon which the grades are based occurs under outdoor road conditions, any comparison between candidate tire performances must involve a standardization of results by correction for the particular environmental conditions of each test. Accordingly, the treadwear performance of a candidate tire is measured by comparing its wear rate with that of a "course monitoring tire" (CMT) run in the same test conditions. The treadwear of the CMT reflects changes in course severity due to factors such as road surface wear and environmental conditions and is used to adjust the measured treadwear of the candidate tire.

Under the current regulations, each test convoy consists of one rear-wheel-drive passenger car with four CMTs and up to three other rear-wheel-drive passenger cars with the candidate tires of the same construction type. 49 CFR § 575.104(e)(1)-(2). Candidate tires on the same axle must be of the identical manufacturer and line, but front tires on a test vehicle may differ from rear tires as long as all four are of the same size designation. After a two circuit (800 mile) break-in period, the initial tread depth of each tire is determined by averaging the depth measures in each groove at six equally spaced points. After each 800 miles of the test, each tire's tread depth is measured again in the same manner, the tires are rotated on the car, the order of the cars in the convoy is changed, and the wheel alignments are readjusted if necessary to come within he ranges of the vehicle manufacturer's specifications. At the end of the 16-circuit test, each tire's overall wear rate is calculated from the tread depths measured after each interval by using the regression line technique in Appendix C of § 575.104.

NHTSA has long been concerned with variability in the treadwear test results and grades. Less variability in treadwear test results will provide consumers with more precise information on relative tread life of different tires. To the extent that the variability in treadwear results is reduced, the treadwear grades calculated from them will provide consumers with more accurate information, Accordingly, the agency has examined possible means to reduce the variability of treadwear. These studies indicate that differences in treadwear are caused by variability in such factors as tire pressure, loading, wheel alignment and suspension, vehicle make and model, the impact of different driver characteristics, tire rotation, and environmental factors such as temperature, presence of moisture, and season.

II. Notice of Proposed Rulemaking

The agency issued a notice of proposed rulemaking on January 19,1989 (54 FR 2167), which proposed four methods that the agency tentatively concluded would make the treadwear grades more representative by reducing the variability or simplifying the calculations related to these grades. First, it proposed to require the wheel alignment of the test vehicle to be set at the midpoint of the permissible range specified by the manufacturer. Second, it proposed to amend the rotation provisions to require convoys to contain four cars so that each tire would be driven on each wheel position on each vehicle for the same distance throughout the convoy. Third, it proposed to simplify the treadwear grading method so that tire tread depth measurements would be taken only after the break-in period and at the conclusion of the test. Fourth, it proposed to replace the current practice of assigning grades in 10-point intervals to reflect differences in treadwear with a new practice of assigning grades in 20-point intervals. Each proposal will be discussed in detail later in the notice.

Comments to NPRM

In response to the NPRM, NHTSA received comments from the Rubber Manufacturers Association (RMA). the European Tyre and Rim Technical Organization (ETRTO), the Japanese Automobile Tire Manufacturers' Association (JATMA), and Standards Testing Laboratories (STL). The agency considered all the comments in developing this final rule and addresses the significant ones below. For the Convenience of the reader, this rule uses the NPRM's organization and format.

III. Amendments to the UTQGS Treadwear Requirements

A. Wheel Alignment Specifications

The current UTQGS provisions require the evaluator to "adjust wheel alinement to that specified by the vehicle manufacturer" after the break-in period and after each 800 miles. (575.104(e)(2)(iv). Because manufacturers typically specify a permissible range for each Lignment factor, this means, in practice, that wheel alignment factors such as toe-in, caster, and camber currently may vary by as much as 1/8 inch. [Toe-in is the degree to which the front wheels turn in so that their forward radii are closer together. Caster is the tilting of the steering axis either forward or backward from the vertical. Camber is the inward or outward tilting of the front wheels from the vertical.]

The NPRM proposed to require a test vehicle's wheel alignment for toe-in, caster, and camber be set at the midpoint of the permissible range specified by the vehicle manufacturer. The agency tentatively concluded that a requirement that precisely specified wheel alignment would serve to reduce the variability of treadwear grades. This proposal was based on a 1983 study by the Southwest Research Institute which determined that a range of 1/8 inch between permissible wheel alignment settings resulted in a variance of as much as 14 percent in the average wear rate for three convoys. ("An Evaluation of the Effects of Load and Pressure on Tire Treadwear." SRI, Docket 00-25-GR-256, DOT HS-806 456, June 1983).

In its comment, RMA recommended that "realistic tolerances be established for each of the alignment settings." Similarly, STL stated that maintaining alignment at the midpoint of the permissible range would, at times, be impossible to achieve. Even if possible to achieve, it commented that such a requirement would raise costs unreasonably.

NHTSA notes that the purpose of the amendment is to reduce variability by prescribing exact alignment

settings rather than a range. Thus. allowing a "tolerance." (i.e., a permissible range of variation) is contrary to the purpose of this amendment. Furthermore. based on NHTSA's actual experiences with wheel alignment, the agency believes that setting precise alignment settings, while difficult, is nonetheless feasible. Once wheel alignment is set, it can be checked and maintained throughout a convoy test. The current procedure requires wheel alignment to be adjusted at the beginning of the test and after each 800 miles. The amendment does not alter the number of alignments but does require greater precision. Even so, because it typically takes less than twenty minutes per car to measure and adjust wheel alignment, the increase in costs, if any, are minimal. ETRTO commented that even though setting the test vehicle's wheel alignment at the midpoint of the manufacturer's specified range would reduce variability of tread wear grades, they believed that the vehicle manufacturer's procedures for setting wheel alignment must be followed. In response to ETRTO's comment and after additional review of practices related to wheel alignment, NHTSA has decided to modify its proposal. The agency notes that vehicle manufacturers sometimes specify nominal settings that are not at the midpoint. For instance, Ford has specified the camber setting for its Crown Victoria to be at a nominal setting of −1/2 inch with a minimum setting of −3/4 inch and maximum setting at +1/4 inch. The agency believes that because a vehicle manufacturer is uniquely situated to prescribe the proper use of its vehicles, its procedures should be followed in setting wheel alignment. Thus, the agency is modifying the f4nal rule to address those cases in which the vehicle manufacturer specifies a nominal setting that is not at the midpoint of the specified range. As amended, the requirements related to wheel alignment in section 575.104(e)(2) provide that the midpoint will be used, unless the manufacturer specifies another setting, in which case the manufacturer's setting will be used. As a practical matter, the agency notes that most testing organizations align wheel settings to the middle of the manufacturer's specifications, or to the nominal setting for caster, camber, and toe-in. Thus, this amendment will formalize current testing and enforcement practices and establish a uniform procedure for all contractors to follow.

B. Tire Rotation Among Convoy Vehicles

The current UTQGS provisions require that tires be rotated to each wheel position on a given passenger car in a test convoy. (575.104(e)). However, tires are not required to be rotated to the other cars in a convoy.

NHTSA proposed amending the treadwear grading provisions to require that tires be rotated among the four passenger cars composing a test convoy. As proposed, each tire would occupy each of the four wheel positions on each of the four cars in a convoy for 400 miles. The agency believed that this proposal would help to eliminate variability in treadwear grades caused by tires being tested on different cars. The proposal was designed to reduce variability caused by driver and vehicle factors that affect the treadwear rates because each tire would be exposed to the same factors at each wheel position on each car in the convoy. The NPRM cited a study which attributed a 30-percent difference between the highest and lowest treadwear rates to factors other than the qualities of the tires themselves. (see "Analysis of Course Monitoring Tires on Vehicles of Different Makes." NHTSA. Docket 00-25-GR-269. June 1988). Based on the study, NHTSA tentatively concluded that this proposal would significantly reduce the variability in treadwear grades resulting from the test car and driver factors.

Several commenters stated that the proposal would be infeasible and create hardships to the testing organizations. RMA stated that the large number of tire and wheel sizes would make the proposal "impossible to achieve." ETRTO stated that the proposal would be restrictive because each vehicle in a convoy would have to be the same type to allow the wheels to be interchangeable. RMA and ETRTO also commented that the proposal would result in a great deal of expense because CMTs would be needed in virtually every size from 13 inch to 17 inch diameters. JATMA similarly believed that the proposal would result in restricting treadwear testing to a single tire size. STL and ETRTO were concerned that the proposal would result in significant cost increases but failed to provide cost data to support this claim. Like RMA. STL stated that the proposal would force testing companies to increase their fleet sizes to accommodate different four-car convoys for each tire size. STL was also concerned that it would be more difficult to get tires for a given test.

NHTSA disagrees with the commenters' concerns about the feasibility and the cost of the proposal to require tire rotation among cars in the test convoy. The agency believes that even though the amendment will require that each vehicle must be able to accommodate all of the tires within the convoy regardless of size, this requirement is necessary to reduce the effects of driver and vehicle variability. The agency does not believe it will be a significant hardship to the industry. The agency notes that manufacturers have established an industry practice in which they test 14-inch tires and apply the test results to grade both 14-inch and 15-inch tires. As a result, approximately 85 percent of the treadwear tests are conducted on 14-inch tires. As for the remaining 15 percent of tires, the agency acknowledges that evaluators will have to test 13-inch and 16-inch tires. However, the agency believes that the manufacturers can minimize the effects of this requirement through planning and coordination. As an option

to running separate convoys for each tire size, it is possible to use versatile vehicles that can be equipped with tires of different sizes. The agency further notes that tires of a certain diameter but of differing tire widths could be part of a four-car convoy because such tires are interchangeable. Similarly, NHTSA does not foresee the amendment resulting in any significant changes in the number of cars in treadwear test convoys, since 89 percent of the convoys in 1988 were composed of four cars.

NHTSA anticipates only a minimal cost impact from the rotation of tires among cars in a treadwear test convoy. The agency expects that the amendment will result in a marginal labor cost increase of approximately $20 per vehicle, which represents only 0.7 percent of the current test cost of $2,750 per vehicle. As for costs associated with the size of a testing organization's vehicle fleet. the agency acknowledges that the amendment may require a testing laboratory to acquire a greater variety of test vehicles for its overall fleet. However, the overall vehicle fleet size will be essentially the same because the miles per vehicle will be unchanged. Thus, the long-term impact of this amendment is to affect the mix of vehicle types and not the overall size of vehicle fleets.

Conversely, the agency anticipates several cost savings and other benefits as a result of this amendment. Most importantly, NHTSA believes that this amendment will further reduce variability by serving as an impetus for UTQGS testing organizations to standardize the type of vehicles selected for the majority of its convoys. It should also serve to reduce the number of convoys, increase the number of candidate tires to be tested by each convoy, and result in a cost savings since the ratio of CMTs to candidate tires will likely be smaller since four car test convoys will be the norm. In addition, the revision to the test procedures will allow radial CMTs to be used in all tests since the tires will be rotated among convoy vehicles in sets of four. Thus, there will be no problem with mixing tires of different construction types on any convoy vehicle. As a result, bias or bias-belted CMTs will no longer be needed.

In response to RMA's concern that some tire and wheel assemblies are so unique to a single vehicle (e.g., the Chevrolet Corvette, which specifies P275/40ZR17 front and P315ZR17 rear tires) as to preclude their use on any other vehicle, NHTSA notes that similar problems occur under the existing rotation requirements. For instance, the vehicle on which the Corvette's 17-inch tires were recently tested had to be modified. because of loading problems. Nevertheless, to reduce the potential hardships of testing tires used on unique vehicles, the agency has modified the final rule to permit two-car convoys along with four-car convoys. Thus, if tires used on unique vehicles need to be tested, only two rather than four cars will have to be modified or leased to test the tires used on such vehicles. The agency notes that tire rotation in a two-car convoy will still require each tire to be tested on each wheel position for the same distance. Therefore. the agency expects that non-tire sources of variability will be similarly reduced in both two-car and four-car convoys.

NHTSA agrees with STL's comment that if different vehicle types are included within a convoy. vehicle weights may have to be adjusted when tires are rotated to a different type of vehicle. Nevertheless, the agency notes that such a situation poses similar problems under the current requirements, which permit candidate tires of different brands or tire lines to be on each axle. Thus, the only significant difference under the amendment will be that tire rotation will be to other vehicles rather than on one vehicle. In addition, as the agency explained above, any requirement that results in an increased standardization of vehicle types in a test convoy is beneficial because it helps to reduce variability.

RMA recommended that NHTSA run one radial CMT convoy each testing day to uniformly define environmental and road surface variations. Under this suggestion, candidate tires would be run in separate convoys of one to four vehicles. RMA stated that its suggestion would have the advantage of requiring only one size and type of CMT.

NHTSA notes that under both the present procedure and the proposal, four CMT tires must accompany the candidate tires in each convoy. This procedure serves to limit the effects of the non-tire sources of variability such as the driver, the test vehicle, and environmental factors. For instance, over the 6,400 mile course, variability caused by changes in weather and the time of day affect treadwear. Therefore. it is essential that the CMTs accompany each convoy to monitor the conditions uniquely affecting that particular convoy.

After reviewing the proposal in light of the comments. NHTSA continues to believe that requiring rotation of tires to each wheel position of each car in a test convoy will limit the effects of vehicle and driver variability. Along with the factors considered in the NPRM. the agency has determined that rotating tires among convoy cars reduces the coefficient of variation for treadwear to 3 percent from the 10 percent level experienced under the current requirement. Accordingly, the notice amends section 575.104(e) to require tires to be rotated among convoy vehicles so that each tire is at each wheel position in the test convoy for the same distance. As mentioned above, in response to RMA's concern about the testing of tires used with unique vehicles, the agency has modified the final rule to permit convoys containing either two or four cars.

C. Simplification of the Treadwearing Grading Procedure

NHTSA also proposed to simplify the grading procedures for measuring tread depth nine times during the 6.400 mile test. Accordingly, an evaluator using a four-car convoy must make 4.320 measurements (the number of cars in a convoy (four) times the number of tires on each car (four) times the grooves on each tire (five) times equally spaced points on each groove (six) times the number of measurements due to tire rotation (nine)). After making these 4,320 measurements. the evaluator must calculate the measured treadwear rate by making a regression analysis of tread depth versus mileage.

NHTSA proposed amending the treadwear grading procedures to reduce the number of tread depth measurements from 9 to 2: after the break-in period and at the end of the testing. The proposal would thus reduce the total measurements from the current 4.320 to 960 measurements.

The agency tentatively concluded that the proposal simplifying the method of measuring tread depth would provide sufficient data to determine treadwear for several reasons. First, since wear rates are essentially linear, only two points are needed to establish the slope of tread wear. Second, an agency study determined that treadwear grades obtained by the simplified two-point method were not significantly different from the nine-point method. ("Treadwear Grade Comparison Between Standard and Simplified Methods," NHTSA, Docket 00-25-GR-270. June 21, 1988]. Third, it noted that the calculation of tires' treadwear rates would also be simplified because a simple arithmetical formula would be used to calculate treadwear rather than the currently required regression analysis.

RMA, ETRTO, JATMA, and STL opposed the proposal to change the treadwear measurement procedures. RMA claimed that the simplified grading method would result in increased variability. It further stated that recording intermediate measures provides a check against errors and treadwear anomalies. ETRTO objected to the simplified method claiming that the grades obtained by the simplified grading method would differ significantly from the current grading procedure. JATMA also favored the current grading practice because the regression analysis is "highly precise."

In response to RMA's specific criticism that variability would increase under the simplified grading method, the agency used both methods to calculate treadwear grades. These calculations indicated that the differences between the two methods were not statistically significant. In the few situations where grade calculations did differ, the differences were typically within the 10-point round off increment. Thus, the differences between the two grading methods would have little, if any, effect on the final grade determination.

In response to RMA's and JATMA s arguments supporting the need for intermediate measurements. the agency notes that its experience with the two-point method is that it accurately measures treadwear without the need for intermediate measurements. The agency wishes to emphasize that the simplified "two-point" grading method is in some respects a misnomer because each data point is actually the average of 30 measurements per tire (five grooves on a tire times six equally spaced points on a groove). Each of the 30 measurements per tire should be the same or only slightly different for that tire; if they differ significantly, the treadwear for that tire will be remeasured. In addition, under the simplified grading measure, the evaluator is still required to inspect for treadwear anomalies when the tires are rotated. Similarly, the tire is immediately inspected if a vehicle experiences an event which may adversely affect treadwear such as hitting an obstacle or hard braking. Thus, even without intermediate measurements, the simplified procedure will still allow for detection of any significant treadwear anomalies.

NHTSA disagrees with ETRTO's comment that "valuable technical data" will be lost if the simplified two-point method is substituted for the nine-point method. While intermediate measurements may provide some information about the trend the treadwear is taking, the agency does not believe that this information is of sufficient importance to warrant requiring the intermediate measurements. The agency further notes that a tire manufacturer or test facility can take the intermediate measurements, if it finds such information worthwhile.

ETRTO stated that because treadwear is non-linear, the grades obtained by the simplified method will differ significantly from the current procedure. The agency agrees that while treadwear is not perfectly linear for radial tires, the differences in terms of assigning treadwear grades will not be significant. In the agency's view. the critical issue is not whether treadwear is perfectly linear but whether the two Methods yield approximately the same grades for radial tires. The agency study cited earlier found that the treadwear grades for radial tires by either the simplified two-point method or the present method are not significantly different. In view of this finding, the agency has determined that the simplified treadwear grading procedure serves as a reasonable measure of radial tire treadwear.

JATMA and STL commented that the regression analysis would be a more precise way to approximate a linear function than the two-point arithmetical formula. NHTSA disagrees with this contention based on its study comparing the two methods. The agency

conducted an evaluation of treadwear testing at the San Angelo test center which showed tread life to be linear for the initial readings of radial tires. However, as the mileage increased, treadwear for radial tires became nonlinear and in fact wear rate decreased. See: "Uniform Tire Quality Grading Course Monitoring," Southwest Research Institute, DOT Institute, DOT-HS 802-526. Because treadwear is not perfectly linear for radial tires, an increase in the number of data points will not improve the precision of the estimated slope for wear. In fact, because the treadwear rate decreases with mileage, the slope based on the two end points is a better projection of the overall tread life for a radial tire than the current method.

After reviewing the comments, NHTSA has decided to permit but not require the simplified treadwear grading method. The agency continues to believe that the simplified grading method will provide representative treadwear grades, while simplifying the test procedures, reducing costs, and reducing the complexity of the calculations. Nevertheless, given that the industry prefers the existing more burdensome grading method, that the proposal was offered as a replacement that is comparable to but not superior to the existing test, and that the agency is aware of no compelling reason to eliminate the more complex procedure, the agency has decided to permit evaluators to rely on it as an alternative. Consequently, section 575.104(e)(2)(ix) permits both the present procedure and the simplified procedure. The manufacturer will be required to identify the method used when the tire grade data are submitted to the agency for compliance verification.

D. Increase Treadwear Grade Interval From 10 TO 20 Points

In determining the treadwear grade to be assigned to a tire, the evaluator currently expresses the projected mileage for a candidate tire as a percentage of 30,000 miles, rounded off to the next lowest 10 percentage points (575.104(e)(ix)(F)). For example, a tire with a projected mileage of 21,000 miles would be graded 70, as would a tire with a projected mileage of 23.000 miles. A tire with a projected mileage of 24.000 miles would be graded 80. Under this 10-point scale. each single grade level interval (i.e., 80 vs. 70) represents a difference of 3,000 miles in projected tread life on the test course.

As explained in the NPRM, the 10-unit scale was designed when most tires were of bias or bias-belted construction. Tires of those constructions generally have projected mileages between 20,000 and 40,000 miles; thus the 3,000 mile difference in projected tread life for each grade interval represents between 7.5 and 15 percent of a tire's projected tread life. In earlier rulemakings. NHTSA determined that this was the proper percentage difference for treadwear grades. In contrast. radial tires, which now comprise approximately 91 percent of the new passenger car tire market, usually have projected treadlife of approximately 60,000 miles., thus the 3.000 mile difference in projected tread life for each grade interval represents approximately 5 percent of a radial tire's projected tread life. Based on these considerations, the agency proposed to increase treadwear grades to 20-point intervals.

The agency proposed that, if adopted, this amendment of the treadwear grade interval would become effective one year after publication of the final rule. (The three other proposals would become effective 30 days after publication of the final rule.) The agency proposed this longer leadtime because it believed that tire manufacturers would need more than 30 days to recompute the grades of some of their existing tire lines. print new labels and brochures with the changed grades, and change their molds to show the changed grades on the sidewall of those tires.

RMA and ETRTO commented that the proposal to increase the grade interval to 20 points would provide no benefit to consumers but would result in significant costs to the tire manufacturers. RMA estimated that the cost of mold reworking and relabeling for treadwear grades of 90, 110, 130 etc. would exceed $2 million. JATMA and ETRTO noted that if the agency adopted the proposal for radial tires, it still should continue to use the 10-point interval for bias and bias belted tires. Alternatively, RMA suggested that radial tires should have a 10-point increment up to a grade of 300 and 20 points above 300.

After reviewing the comments, the agency has decided to adopt the 20-point interval, as proposed. Since the passenger car tire market is now comprised predominantly of radial tires whose treadwear grades typically run above 200, with many approaching 300, the 10-point interval has become less relevant to a consumer's buying decision. For instance, it would be unlikely for a consumer to view the difference between a 290 tire and a 280 tire as significant. In addition, the normal variation of treadlife inherent among tires within given tire lines means that the 10-point interval, which represents intervals of only 5 percent, might convey information that was not useful and even misleading to consumers. Given the agency's goal of having a treadwear scale that allows for reasonable comparisons among tire lines. without unduly emphasizing the precision of the measurement, the agency has decided to adopt the 20-point treadwear grade interval.

The agency also disagrees that the amendment to increase the grade interval to 20 points will significantly increase costs. First. 68 percent of tire lines currently correspond to the proposed 20-point interval

(200 220, 240 etc.) Thus, only the remaining 32 percent of the tire lines need to have the treadwear grade reassigned. Even these tire lines need not be retested, since a manufacturer may lower a grade (e.g., from 210 to 200). Moreover the one year leadtime should further reduce the cost impact given that molds are typically refurbished each year. labels are typically exhausted within six months to one year, and brochures are updated and distributed to dealers on an annual basis.

NHTSA has decided to reject the suggestion that the treadwear grade interval remain at 10-point intervals for bias and bias-belted tires. As noted above, such tires are currently a very small segment of the total passenger car tire market. In the last few years, only two bias-belted tire convoys and one bias-ply convoy have been run at the San Angelo UTQGS test course. Thus, a separate grade interval for non-radial tires is not needed and would be contrary to the agency's goal to standardize treadwear grading procedures. To effectuate such standardization of treadwear grades, the agency must select a single grade interval. Because the vast majority of passenger car tires are and will increasingly be of radial construction. the agency has decided to replace the 10-point interval with the 20-point interval.

NHTSA is also rejecting RMA's suggestion to have a 10-point scale until a treadwear grade of 300 and then a 20-ooint scale over 300. The agency believes that such a dual scale would unnecessarily complicate treadwear grading without providing any significant benefit. Based on the above considerations. the agency has determined that the 20-point scale should apply to all treadwear grades, not just to grades above 300.

In response to RMA's comment that existing radial tires graded prior to the effective date need not be regraded thus precluding the need to remark thousands of tire molds, the agency notes that the rule will not require tires with treadwear grades molded before the effective date to be remolded. Nevertheless, given 575.104(d)(l)'s molding and labeling requirements in relation to 575.104(d)(2)(i)'s new requirement that "treadwear grades shall be in multiples of 20. (e.g., BO. 120, 160)." the rule will require the treadwear grade to be remolded and relabeled when the one year leadtime expires (see also the grading requirement in 575.104(e)(2)(ix)(F)). This leadtime should be adequate to exhaust existing inventories. As for regrading, a manufacturer can avoid hardship by merely grading the tire to the next lower 20-point interval (e.g., a tire with a raw grade of "131" would be assigned a treadwear grade of "120" rather than "130.") Of course, if the manufacturer retests such tires and wishes to change the grade, the 20-point interval will apply.

Miscellaneous Considerations:

RMA suggested that the agency should consider alternative test vehicles to include light trucks and front-wheel-drive vehicles. STL also commented that front-wheel-drive vehicles and pickup trucks should be used as test vehicles. The agency notes that whether to use non-passenger cars or front-wheel-drive cars is beyond the scope of the rulemaking.

STL stated that specific instructions would be helpful on those tires which have directional tread designs. The agency notes that unusual tire features. such as directional tread design, are generally accommodated by making appropriate modifications in the test procedures. For example tire depth measurements are taken at more points around the tire for those with two or three grooves. For directional tires, rotation could be limited to one side or the tire could be remounted on the rim when rotated to the other side of the vehicle.

Economic and Other Impacts

NHTSA has analyzed this rule and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation regulatory policies and procedures. The agency believes that a full regulatory evaluation is not required because the rule will have only minimal economic impacts. The agency believes that there will be no significant additional costs related to the first amendment because it merely entails changes to the current testing procedures. Although the second amendment will result in additional labor costs and initial costs related to obtaining CMTs, these costs are minimal and may be offset by the savings resulting from the third amendment. As for tire rotation, the test procedure had required tires be rotated after the first 400 miles, at the completion of break-in (800 miles), and seven times thereafter in 800-mile increments, or a total of nine times during the 6,400 mile test. Under the second amendment, tires will be rotated 17 times, thus adding to the time and cost of testing. Specifically, 16 tires will be removed from the four vehicles in the convoy and rotated to different wheel or vehicle positions every 400 miles. after break-in. According to agency staff in San Angelo, this operation generally takes two people approximately 30 minutes to complete or one labor-hour per convoy. Thus, this amendment will result in eight additional labor-hours per four vehicle test convoy. The number of convoys (each composed of four vehicles₃ which completed treadwear testing at San Angelo was 200 in 1986 and 174 in 1987. Accordingly, based on a two-year average from 1986 and 1987 (187 convoys) the amendment requiring eight additional tire rotations will add 1,496 labor hours to the test. Assuming a labor and overhead rate of $10 per hour for tire changes, the increased cost will be $14,960 per year.

As for the third amendment permitting a simplified treadwear grading method, the treadwear grading method had required tread-depth measurements for each tire at nine intervals during a test sequence. With this method, two people took approximately two hours to measure and record tread depth at each interval. However, under the simplified grading procedure, an evaluator need only measure and record two intervals per test sequence per convoy. This amendment thus permits seven fewer intervals, resulting in 28 fewer labor hours per convoy (seven intervals x two workers x two hours). Based on the two year average of 187 convoys, this amendment has the potential of resulting in an annual savings of 5,236 labor hours. Assuming a labor rate of $10 per hour, permitting the simplified grading method has the potential to save $52,360. Assuming evaluators adopt this simplified grading method the savings from this amendment will offset the $14,960 additional cost from the second amendment requiring tire rotation among convoy vehicles.

The agency notes that the one-year leadtime for the fourth amendment to change the grade interval will ensure that there are no additional printing or similar costs.

In consideration of the foregoing. 49 CFR § 575.104. Uniform Tire Quality Grading Standards is amended as follows:

1. Section 575.104(d)(2)(i) is revised to read as follows:

(2) Performance—(i) Treadwear. Each tire shall be graded for treadwear performance with the word "TREADWEAR" followed by a number of two or three digits representing the tire's grade for treadwear, expressed as a percentage of the NHTSA nominal treadwear value, when tested in accordance with the conditions and procedures specified in paragraph (e) of this section. Treadwear grades shall be in multiples of 20. (e.g., 80, 120, 160).

2. Section 575.104(e) is revised to read as follows:

(e) *Treadwear grading conditions and procedures*

(1) Conditions

(i) Tire treadwear performance is evaluated on a specific roadway course approximately 400 miles in length, which is established by the NHTSA both for its own compliance testing and for that of regulated persons. The course is designed to produce treadwear rates that are generally representative of those encountered by tires in public use. The course and driving procedures are described in Appendix A of this section.

(ii) Treadwear grades are evaluated by first measuring the performance of a candidate tire on the government test course. and then correcting the projected mileage obtained to account for environmental variations on the basis of the performance of the course monitoring tires run in the same convoy. The course monitoring tires are made available by the NHTSA at Goodfellow Air Force Base, San Angelo, Texas, for purchase by any persons conducting tests at the test course.

(iii) In convoy tests, each vehicle in the same convoy, except for the lead vehicle, is throughout the test within human eye range of the vehicle immediately ahead of it.

(iv) A test convoy consists of two or four passenger cars, each having only rear-wheel drive.

(v) On each convoy vehicle, all tires are mounted on identical rims of design or measuring rim width specified for tires of that size in accordance with 49 CFR 571.109, S4.4.1(a) or (b), or a rim having a width within −0 to +.0.50 inches of the width listed.

(2) *Treadwear grading procedure.*

(i) Equip a convoy as follows: Place four course monitoring tires on one vehicle. Place four candidate tires with identical size designations on each other vehicle in the convoy. On each axle, place tires that are identical with respect to manufacturer and line.

(ii) Infate each candidate and each course monitoring tire to the applicable pressure specified in Table 1 of this section.

(iii) Load each vehicle so that the load on each course monitoring and candidate tire is 85 percent of the test load specified in § 575.104(h).

(iv) Adjust wheel alignment to the midpoint of the vehicle manufacturer's specifications, unless adjustment to the midpoint is not recommended by the manufacturer; in that case, adjust the alignment to the manufacturer's recommended setting.

(v) Subject candidate and course monitoring tires to "break-in" by running the tires in the convoy for two circuits of the test roadway (800 miles). At the end of the first circuit, rotate each vehicle's tires by moving each front tire to the same side of the rear axle and each rear tire to the opposite side of the front axle. Visually inspect each tire for any indication of abnormal wear, tread separation, bulging of the sidewall, or any sign of tire failure. Void the grading results from any tire with any of these anomalies, and replace the tire.

(vi) After break-in, allow the air pressure in the tires to fall to the applicable pressure specified in Table I of this section or for 2 hours, whichever occurs first. Measure, to the nearest 0.001 inch, the tread depth of each candidate and each course monitoring tire, avoiding treadwear indicators, at six equally spaced points in each groove. For each tire compute the average of the measurements. Do not measure those shoulder grooves which are not provided with treadwear indicators.

(vii) Adjust wheel alignment to the midpoint of the manufacturer's specifications. unless adjustment to the midpoint is not recommended by the manufacturer; in that case, adjust the alignment according to the manufacturer's recommended setting.

(viii) Drive the convoy on the test roadway for 6,400 miles.

(A) After each 400 miles, rotate each vehicle's tires by moving each front tire to the same side of the rear axle and each rear tire to the opposite side of the front axle. Visually inspect each tire for treadwear anomalies.

(B) After each 800 miles, rotate the vehicles in the convoy by moving the last vehicle to the lead position. Do not rotate driver positions within the convoy. In four-car convoys. vehicle one shall become vehicle two, vehicle two shall become vehicle three, vehicle three shall become vehicle four. and vehicle four shall become vehicle one.

(C) After each 800 miles, if necessary, adjust wheel alignment to the midpoint of the vehicle manufacturer's specification, unless adjustment to the midpoint is not recommended by the manufacturer; in that case, adjust the alignment to the manufacturer's recommended setting.

(D) After each 800 miles. if determining the projected mileage by the 9-point method set forth in (e)(2)(ix)(A)(1), measure the average tread depth of each tire following the procedure set forth in paragraph (e)(2)(vi).

(E) After each 1,600 miles, move the complete set of four tires to the following vehicle. Move the tires on the last vehicle to the lead vehicle. In moving the tires, rotate them as set forth in (e)(2)(viii)(A).

(F) At the end of the test measure the tread depth of each tire pursuant to the procedure set forth in paragraph (e)(2)(vi).

(ix)(A) Determine the prolected mileage for each candidate tire either by the nine-point method of least squares set forth in (e)(2)(ix)(A)(1) and Appendix C or by the two-point arithmetical method set forth in (e)(2)(ix)(A)(2). Notify NHTSA about which of the alternative grading methods in being used.

(1) *Nine-Point Method of Least Squares.* For each course monitoring and candidate tire in the convoy, using the average tread depth measurements obtained in accordance with paragraph (e)(2)(vi) and (e)(2)(viii)(D) of this section and the corresponding mileages as data points, apply the method of least squares as described in Appendix C to this section to determine the estimated regression line of y on x given by the following formula:

$$y = a + \frac{bx}{1000}$$

Where:

y = average tread depth in mils

x = miles after break-in,

a = y intercept of regression line (reference tread depth) in mils, calculated using the method of least squares; and

b= the slope of the regression line in mils of tread depth per 1,000 miles, calculated using the method of least squares. This slope will be negative in value. The tire's wear rate is defined as the absolute value of the slope of the regression line.

(2) *Two-Point Arithmetical Method.* For each course monitoring and candidate tire in the convoy, using the average tread depth measurements obtained in accordance with paragraph (e)(2)(vi) and (e)(2)(viii)(F) of this section and the corresponding mileages as data points, determine the slope (m) of the tire's wear in mils of tread depth per 1,000 miles by the following formula:

$$m = 1000 \frac{(Y1\text{-}Yo)}{(X1\text{-}Xo)}$$

Where:

Yo = average tread depth after break-in, mils

Y1 =average tread depth at 6,400 miles, mils

Xo = miles (after break-in).

X1 = 6,400 miles of travel

This slope (m) will be negative in value. The tire's wear rate is defined as the slope (m) expressed in mils per 1000 miles.

(B) Average the wear rates of the four course monitoring tires as determined in accordance with paragraph (e)(2)(ix)(A) of this section.

(C) Determine the course severity adjustment factor by dividing the base wear rate for the course monitoring tires (see note below) by the average wear rate for the four course monitoring tires.

NOTE: The base wear rates for the course monitoring tires will be furnished to the purchaser at the time of purchase.

(D) Determine the adjusted wear rate for each candidate tire by muitiplying its wear rate determined in accordance with paragraph (e)(2)(ix)(A) of this section by the course severity adjustment factor determined in accordance with paragraph (e)(2)(ix)(C) of this section.

(E) Determine the projected mileage for each candidate tire by applying the appropriate formula set forth below:

(1) If the projected mileage is calculated pursuant to (e)(2)(ix)(a)(1), then

$$\text{Projected mileage} = \frac{1000\ (a-62)}{b^1} + 800$$

Where:

a = y intercept of regression line (reference tread depth) for the candidate tire as determined in accordance with paragraph (e)(2)(ix)(A)(1) of this section.

b^1 the adjusted wear rate for the candidate tire as determined in accordance with paragraph (e)(2)(ix)(D) of this section.

(2) If the projected mileage is calculated pursuant to (e)(2)(ix)(a)(2), then:

$$\text{Projected mileage} = -\frac{1000\ (Yo\text{-}62)}{mc} + 800$$

Where

Yo = average tread depth after break-in, mils

mc = the adjusted wear rate for the candidate tires as determined in accordance with paragraph (e)(2)(ix)(D) of this section.

(F) Compute the percentage (P) of the NHTSA nominal treadwear value for each candidate tire using the following formula:

$$P = \frac{\text{Projected mileage}}{30{,}000} \times 100$$

Round off the percentage to to the nearest lower 20-point increment.

Issued on: November 9, 1990

Jerry Ralph Curry
Administrator

55 F.R. 47765
November 15, 1990

PREAMBLE TO AN AMENDMENT TO PART 575

Consumer Information Regulations
(Docket No. 90-042; Notice 2)
RIN 2127-AD21

ACTION: Final Rule.

SUMMARY: This notice amends Standard No. 109, *New Pneumatic Tires,* to permit passenger car tires with a maximum inflation pressure of 290, 330, 350, or 390 kPa, in response to a petition to allow the "CT" tire and rim (an inverted flange tire and rim system). The tire has run-flat capability. After evaluating the petition and comments to the proposal, NHTSA has concluded that the CT tire has the potential for increased safety, especially in the deflated condition, and may result in incidental benefits such as increased fuel efficiency. Conforming amendments have been made throughout Standard No. 109 and the Uniform Tire Quality Grading Standards to establish criteria suitable for tires with new pressures.

DATES: Effective date: The final rule is effective on December 31, 1990.

SUPPLEMENTARY INFORMATION:

Background

Federal Motor Vehicle Standard No. 109, *New Pneumatic Tires,* (49 CFR § 571.109) specifies tire dimensions and laboratory test requirements for bead unseating resistance, tire strength, tire endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires used on passenger cars.

Until the effective date of the amendments adopted in this rule, Standard No. 109 requires passenger car tires to have a maximum inflation pressure of either 32, 36, 40, or 60 psi (pounds per square inch), or 240, 280, 300, or 340 kPa (kiloPascals). These maximum inflation pressures are incorporated in Table I-C "Radial Ply Tires" and Table II, "Test Inflation Pressures," which are in Appendix A. In addition, Figure 1 specifies wheel sizes for tires relative to the tubeless tire bead unseating resistance tests in section S5.2.1. The Uniform Tire Quality Grading Standards ("UTQGS" at 49 CFR 575.104) sets forth similar requirements for maximum permissible inflation pressures for the testing procedures in Table 1, Table 2, and Table 2A.

A new pneumatic passenger car tire must comply with requirements for bead unseating, tire strength, tire endurance, and high speed endurance at a maximum permissible inflation pressure specified in Standard 109. The agency specifies a limited number of permissible maximum inflation pressures (or wheel sizes, in the case of the bead unseating test) to facilitate compliance testing.

On March 8, 1989, Continental AG. Daimler-Benz, and General Tire Inc. petitioned the agency to amend Standard No. 109 and the UTQGS to permit the use of a new tire and rim concept known as the "CT" tire. With this tire, the rim flanges point radially inward and the tire fits on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire. The amendments were necessary because the CT tire is usuable only at maximum inflation pressures that were not specified in Standard No. 109. Accordingly, the petitioners requested the agency to amend the standard to include four new maximum inflation pressures—290, 330, 350, and 390 kPa. The petitioners stated that amending Standard No. 109 to permit the CT tire would result in an increased level of safety compared to conventional radial tires in cases of flats, significant under-inflation from gradual air loss, or blowouts from sudden air loss. They stated that unlike a conventional tire, a CT tire with a flat may still be driven safely at normal highway speeds for up to 200 miles. A driver therefore could travel to a service station instead of changing the flat tire in a dangerous or inconvenient setting. They also stated that unlike a conventional tire, a CT tire that is under-inflated or experiences sudden air loss would not result in any appreciable loss of control because the tire would not leave the rim. The petitioners stated that the requested amendment would result in incidental benefits, including allowing a vehicle to have larger brake, suspension, and anti-lock brake systems, shorter stopping distances, greater resistance to hydroplaning, better distribution of the tire footprint pressure, and increased fuel savings by reducing the overall vehicle weight. The petitioner's test and other data on the performance of the CT tire indicated that

Table 1.—Test Inflation Pressures

Test Type	*Maximum permissible inflation pressure for the following test:*											
	lbs/in²				*kPa*				*kPa (1)*			
	32	*36*	*40*	*60*	*240*	*280*	*300*	*340*	*290*	*330*	*350*	*390*
Treadwear test	24	28	32	52	180	220	180	220	230	270	230	270
Temperature resistance test	30	34	38	58	220	260	220	260	270	310	270	310

(1) For CT tires only

Table 2 [1]

Maximum Inflation Pressure	*Multiplier to be used for treadwear testing*	*Multiplier to be used for traction testing*
32 lbs/in²	.851	.851
36 lbs/in²	.870	.797
40 lbs/in²	.883	.753
240 kPa	.866	.866
280 kPa	.887	.804
300 kPa	.866	.866
340 kPa	.887	.804
290 kPa (1) ...	.866	.866
330 kPa (1) ...	.887	.804
350 kPa (1) ...	.866	.866
390 kPa (1) ...	.887	.804

(1) For CT tires only

[1] Prior to July 1, 1984, the multipliers in the above table are not to be used in determining loads for the tire size designations listed below in Table 2A. For those designations, the load specifications in that table shall be used in UTQG testing during that period. These loads are the actual loads at which testing shall be conducted and should not be multiplied by the 85 percent factors specified for treadwear and traction testing.

19057.1—M-151

when properly inflated, would comply with Standard No. 109's performance requirements. They also tested the CT tire while in its deflated stage to determine whether the tire would leave the rim or come apart when driven through various maneuvers.

On February 14, 1990, the agency issued a notice of proposed rule making (NPRM) proposing to amend Standard No. 109 to include additional maximum inflation pressures for pneumatic tires on passenger cars (55 FR 5237). The NPRM summarized previous rulemakings in which the agency amended Standard No. 109 to permit additional maximum inflation pressures. (See 53 FR 17950, May 19, 1988, 53 FR 936, January 14, 1988; and (43 FR 8570, March 2, 1978; 43 FR 24310, June 5, 1978). In those earlier rulemakings, the agency determined that amending the standard's specifications for the maximum permissible inflation pressure was necessary to permit a new tire technology to carry a load comparable to that carried by tires already in compliance with the standard.

NHTSA decided to propose amending Standard No. 109 to permit tires with maximum inflation pressures of 290, 330, 350, or 390 kPa, after tentatively concluding that the CT tire had the potential for increased safety, especially in the deflated condition. The agency also tentatively concluded that allowing the CT tire might result in incidental benefits such as increased fuel efficiency. The notice proposed conforming amendments to Standard No. 109 and the Uniform Tire Quality Grading Standards (49 CFR 575.104) to establish test criteria suitable for tires with the new maximum inflation pressures.

NHTSA received comments from ETRTO, the Rubber Manufacturers Association (RMA), and five tire or motor vehicle manufacturers. All commenters favored the proposal. The agency therefore is adopting the proposed amendments for the reasons set forth in the NPRM.

In response to technical comments, the agency is modifying certain provisions in its UTQGS regulations relative to the inclusion of CT tires. NHTSA agrees with the petitioner's comment that the proposal's headings in Tables 1 and 2 of 49 CFR 575.104 do not best reflect temperature resistance testing under the UTQGS. The final rule therefore adopts more appropriate wording suggested in the petitioner's comments. The final rule also includes certain treadwear and traction testing multipliers to Table 2, which were inadvertently omitted in the NPRM.

The agency agrees with RMA's comment that the agency should not include the phrase "or equivalent" to 575.104(e)(2)(i) given that the tires on any one vehicle should be of the same size designation and that the additional phrase would have added imprecision to UTQGS.

The agency has decided not to adopt RMA's request to amend 575.104(f)(2)(B) rather than (f)(2)(D)(viii)(sic) because the CT tire inflation pressures are for candidate tires subject to 575.104 (f)(2)(viii); while (f)(2)(B) refers to standard test tires.

NHTSA notes that section 103(c) of the Vehicle Safety Act requires that each order shall take effect no sooner than 180 days from the date the order is issued unless "good cause" is shown that an earlier effective date is in the public interest. The agency has concluded that there is "good cause" not to provide the full 180 day lead-in period given that this amendment will facilitate the introduction of certain tires without imposing any mandatory requirement on manufacturers. In addition, the public interest will be served by not delaying the introduction of tires that can provide better performance without having any negative impact on safety. Therefore, the agency has determined that there is good cause to set an effective date 30 days after publication of the final rule.

In consideration of the foregoing, 49 CFR Part 571 and 575 is amended as follows:

A new sentence is added to 575.104 (f)(2)(viii) immediately after the first sentence. The first sentence is being republished for the convenience of the reader.

* * * *

(f) * * * *
(2) * * * *

(viii) Prepare two candidate tires of the same construction type, manufacturer, line, and size designation in accordance with parapgraph (f)(2)(i) of this section, mount them on the test apparatus, and test one of them according to the procedures of paragraph (f)(2)(ii) through (v) of this section, except load each tire to 85 percent of the test load specified in 575 104(h). For CT tires, the test inflation of candidate tires shall be 230 kPa.

11. Revised Table 1 of Part 575 follows.

12. Revised Table 2 of Part 575 follows.

Issued on : November 9, 1990.

Jeffrey R. Miller
Deputy Administrator

55 F.R. 49619
November 30, 1990

(c) *Application.* (1) This section applies to new pneumatic tires for use on passenger cars. However, this section does not apply to deep tread, winter-type snow tires, space-saver or temporary use spare tires, tires with nominal rim diameters of 10 to 12 inches, or to limited production tires as defined in paragraph (c)(2) of this section.

(2) "Limited production tire" means a tire meeting all of the following criteria, as applicable:

(i) The annual domestic production or importation into the United States by the tire's manufacturer of tires of the same design and size as the tire does not exceed 15,000 tires;

(ii) In the case of a tire marketed under a brand name, the annual domestic purchase or importation into the United States by a brand name owner of tires of the same design and size as the tire does not exceed 15,000 tires;

(iii) The tire's size was not listed as a vehicle manufacturer's recommended tire size designation for a new motor vehicle produced in or imported into the United States in quantities greater than 10,000 during the calendar year preceeding the year of the tire's manufacturer; and

(iv) The total annual domestic production or importation into the United States by the tire's manufacturer, and in the case of a tire manufacturer, and in case of a tire marketed under a brand name, the total annual domestic purchase or purchase for importation into the United States by the tire's brand name owner, of tires meeting the criteria of paragraphs (c)(2) (i), (ii), and (iii) of this section, does not exceed 35,000 tires.

Tire design is the combination of general structural characteristics, materials, and tread pattern, but does include cosmetic, identifying or other minor variations among tires.

(d) *Requirements.*

(1) *Information.*

(i) Each manufacturer of tires, or in the case of tires marketed under a brand name, each brand name owner, shall provide grading information for each tire of which he is the manufacturer or brand name owner in the manner set forth in paragraphs (d) (1) (i) (A) and (d) (1) (i) (B) of this section. The grades for each tire shall be only those specified in paragraph (d) (2) of this section. Each tire shall be able to achieve the level of performance represented by each grade with which it is labeled. An individual tire need not, however, meet further requirements after having been subjected to the test for any one grade.

(A) Except for a tire line, manufactured within the first six months of production of the tire line, each tire shall be graded with the words, letters, symbols, and figures specified in paragraph (d) (2) of this section, permanently molded into or onto the tire sidewall between the tire's maximum section width and shoulder in accordance with one of the methods in Figure 1.

(B) (*1*) Each tire manufactured before October 1, 1980, other than a tire sold as original equipment on a new vehicle, shall have affixed to its tread surface in a manner such that it is not easily removable a label containing its grades and other information in the form illustrated in Figure 2, Part II, bearing the heading "DOT QUALITY GRADES." The treadwear grade attributed to the tire shall be either imprinted or indelibly stamped on the label adjacent to the description of the treadwear grade. The label shall also depict all possible grades for traction and temperature resistance. The traction and temperature resistance performance grades attributed to the tire shall be indelibly circled. However, each tire labeled in conformity with the requirements of paragraph (d)(1)(i)(B)(*2*) of this section need not comply with the provisions of this paragraph.

(*2*) Each tire manufactured on or after October 1, 1980, other than a tire sold as original equipment on a new vehicle, shall have affixed to its tread surface so as not to be easily removable a label or labels containing its grades and other information in the form illustrated in Figure 2, Parts I and II. The treadwear grade attributed to the tire shall be either imprinted or indelibly stamped on the label containing the material in Part I of Figure 2, directly to the right of or below the word "TREADWEAR". The traction and temperature resistance performance grades attributed to the tire shall be indelibly circled in an array of the potential grade letters (ABC) directly to the right of or below the words "TRACTION" and "TEMPERATURE" in Part I of Figure 2. The words "TREADWEAR," "TRACTION," and "TEMPERATURE," in that order, may be laid out

vertically or horizontally. The text part of Part II of Figure 2 may be printed in capital letters. The text of Part I and the text of Part II of Figure 2 need not appear on the same label, but the edges of the two texts must be positioned on the tire tread so as to be separated by a distance of no more than one inch. If the text of Part I and the text of Part II are placed on separate labels, the notation "See EXPLANATION OF DOT QUALITY GRADES" shall be added to the bottom of the Part I text, and the words "EXPLANATION OF DOT QUALITY GRADES" shall appear at the top of the Part II text. The text of Figure 2 shall be oriented on the tire tread surface with lines of type running perpendicular to the tread circumference. If a label bearing a tire size designation is attached to the tire tread surface and the tire size designation is oriented with lines of type running perpendicular to the tread circumference, the text of Figure 2 shall read in the same direction as the tire size designation.

(ii) In the case of information required in accordance with § 575.6(c) to be furnished to prospective purchasers of motor vehicles and tires, each vehicle manufacturer and each tire manufacturer or brand name owner shall as part of that information list all possible grades for traction and temperature resistance, and restate verbatim the explanations for each performance area specified in Figure 2. The informatio need not be in the same format as in Figure 2. In the case of a tire manufacturer or brand name owner, the information must indicate clearly and unambiguously the grade in each performance area for each tire of that manufacturer or brand name owner offered for sale at the particular location.

(iii) In the case of information required in accordance with § 575.6(a) to be furnished to the first purchaser of a new motor vehicle, other than a motor vehicle equipped with bias-ply tires manufactured prior to October 1, 1979, and April 1, 1980, and a radial-ply tire manufactured prior to October 1, 1980, each manufacturer of motor vehicles shall as part of the information list all possible grades for traction and temperature resistance and restate verbatim the explanation for each performance area specified in Figure 2. The information need not be in the format of Figure 2, but it must contain a statement referring the reader to the tire sidewall for the specific tire grades for the tires with which the vehicle is equipped.

(2) *Performance.*

(i) *Treadwear.* Each tire shall be graded for treadwear performance with the word "TREADWEAR" followed by a number of two of three digits representing the tire's grade for treadwear, expressed as a percentage of the NHTSA nominal treadwear value, when tested in accordance with the conditions and procedures specified in paragraph (e) of this section. Treadwear grades shall be multiples of [20 (e.g., 80, 120, 160).]

(ii) *Traction.* Each tire shall be graded for traction performance with the word "TRACTION," followed by the symbols C, B, or A (either asterisks or 5-pointed stars) when the tire is tested in accordance with the conditions and procedures specified in paragraph (f) of this section.

(A) The tire shall be graded C when the adjusted traction coefficient is either:

(*1*) 0.38 or less when tested in accordance with paragraph (f) (2) of this section on the asphalt surface specified in paragraph (f) (1) (i) of this section, or

(*2*) 0.26 or less when tested in accordance with paragraph (f) (2) of this section on the concrete surface specified in paragraph (f) (1) (i) of this section.

(B) The tire may be graded B only when its adjusted traction coefficient is both:

(*1*) More than 0.38 when tested in accordance with paragraph (f) (2) of this section on the asphalt surface specified in paragraph (f) (1) (i) of this section, and

(*2*) More than 0.26 when tested in accordance with paragraph (f) (2) of this section on the concrete surface specified in paragraph (f) (1) (i) of this section.

(C) The tire may be graded A only when its adjusted traction coefficient is both:

(*1*) More than 0.47 when tested in accordance with paragraph (f) (2) of this section on the asphalt surface specified in paragraph (f) (1) (i) of this section, and

(*2*) More than 0.35 when tested in accordance with paragraph (f) (2) of this section on the concrete surface specified in paragraph (f) (1) (i) of this section.

(iii) *Temperature resistance.* Each tire shall be graded for temperature resistance performance with the word "TEMPERATURE" followed by the letter A, B, or C, based on its performance when the tire is tested in accordance with the procedures specified in paragraph (g) of this section. A tire shall be considered to have successfully completed a test stage in accordance with this paragraph if, at th end of the test stage, it exhibits no visual evidence of tread, sidewall, ply, cord, innerliner or bead separation, chunking, broken cords, cracking or open splices a defined in § 571.109 of this chapter, and the tire pressure is not less than the pressure specified in paragraph (g) (1) of this section.

(A) The tire shall be graded C if it fails to complete the 500 rpm test stage specified in paragraph (g) (9) of this section.

(B) The tire may be graded B only if it successfully completes the 500 rpm test stage specified in paragraph (g) (9) of this section.

(C) The tire tay be graded A only if it successfully completes the 575 rpm test stage specified in paragraph (g) (9) of this section.

(e) *Treadwear grading conditions and procedures.*— (1) *Conditions.* (i) Tire treadwear performance is evaluated on a specific roadway course approximately 400 miles in length, which is established by the NHTSA both for its own compliance testing and for that of regulated persons. The course is designed to produce treadwear rates that are generally representative of those encountered by tires in public use. The course and driving procedures are described in Appendix A to this section.

(ii) Treadwear grades are evaluated by first measuring the performance of a candidate tire on the government test course, and then correcting the projected mileage obtained to account for environmental variations on the basis of the performance of the course monitoring tires run in the same convoy. The course monitoring tires are made available by the NHTSA at Goodfellow Air Force Base, San Angelo, Tex., for purchase by any persons conducting tests at the test course.

(iii) In convoy tests each vehicle in the same convoy, except for the lead vehicle, is throughout the test within human eye range of the vehicle immediately ahead of it.

(iv) A test convoy consists of two or four passenger cars, each having only rear-wheel drive.

(v) On each convoy vehicle, all tires are mounted on identical rims of design or measuring rim width specified for tires of that size in accordance with 49 CFR 571.109, § 4.4.1(a) or (b), or a rim having a width within −0 to +0.50 inches of the width listed.

(2) *Treadwear grading procedure.* (i) [Equip a convoy as follows: Place four course monitoring tires on one vehicle. Place four candidate tires with identical size designations on each other vehicle in the convoy. On each axle, place tires that are identical with respect to manufacturer and line.

(ii) Inflate each candidate and each course monitoring tire to the applicable pressure specified in Table 1 of this section.

(iii) Load each vehicle so that the load on each course monitoring and candidate tire is 85 percent of the test load specified in § 575.104(h).

(iv) Adjust wheel alignment to the midpoint of the vehicle manufacturer's specifications, unless adjustment to the midpoint is not recommended by the manufacturer; in that case, adjust the alignment to the manufacturer's recommended setting.

(v) Subject candidate and course monitoring tires to "break-in" by running the tires in convoy for two circuits of the test roadway (800 miles). At the end of the first circuit, rotate each vehicle's tires by moving each front tire to the same side of the rear axle and each rear tire to the opposite side of the front axle. Visually inspect each tire for any indication of abnormal wear, tread separation, bulging of the sidewall, or any sign of tire failure. Void the grading results from any tire with any of these anomalies, and replace the tire.

(vi) After break-in, allow the air pressure in the tires to fall to the applicable pressure specified in Table I of this section or for 2 hours whichever occurs first. Measure, to the nearest 0.001 inch, the tread depth of each candidate and each course monitoring tire, avoiding treadwear indicators, at six equally spaced points in each groove. For each tire compute the average of the measurements. Do not measure those shoulder grooves which are not provided with treadwear indicators.

(vii) Adjust wheel alignment to the midpoint of the manufacturer's specifications, unless adjustment to the midpoint is not recommended by the manufacturer; in that case, adjust the alignment according to the manufacturer's recommended setting.

(viii) Drive the convoy on the test roadway for 6,400 miles.

(A) After each 400 miles, rotate each vehicle's tires by moving each front tire to the same side of the rear axle and each rear tire to the opposite side of the front axle. Visually inspect each tire for treadwear anomalies.

(B) After each 800 miles, rotate the vehicles in the convoy by moving the last vehicle to the lead position. Do not rotate driver positions within the convoy. In four-car convoys, vehicle one shall become vehicle two, vehicle two shall become vehicle three, vehicle three shall become vehicle four,and vehicle four shall become vehicle one.

(C) After each 800 miles, if necessary, adjust wheel alignment to the midpoint of the vehicle manufacturer's specification, unless adjustment to the midpoint is not recommended by the manufacturer; in that case, adjust the alignment to the manufacutrer's recommended setting.

(D) After each 800 miles, if determining the projected mileage by the 9-point method set forth in (e)(2)(ix)(a)(1), measure the average tread depth of each tire following the procedure set forth in paragraph (e)(2)(vi).

(E) After each 1,600 miles, move the complete set of four tires to the following vehicle. Move the tires on the last vehicle to the lead vehicle. In moving the tires, rotate them as set forth in (e)(2)(viii)(A).

(F) At the end of the test, measure the tread depth of each tire pursuant to the procedure set forth in paragraph (e)(2)(vi).

(ix)(a) Determine the projected mileage for each candidate tire either by the nine-point method of least squares set forth in (e)(2)(ix)(A)(1) and Appendix C, or by the two-point arithmetical method set forth in (e)(2)(ix)(A)(2). Notify NHTSA about which of the alternative grading methods is being used.

(1) *Nine-Point Method of Least Squares.* For each course monitoring and candidate tire in the convoy, using the average tread depth measurements obtained in accordance with paragraphs (e) (2) (vi) of this section and the corresponding mileages as data points, apply the method of least squares as described in Appendix C of this section to determine the estimated regression line of y on x given by the following formula:

$$y = a + \frac{bx}{1000}$$

where:

y = average tread depth in mils,

x = miles after break-in,

a = y intercept of regression line (reference tread depth) in mils, calculated using the method of least squares; and

b = the slope of the regression line in mils of tread depth per 1,000 miles, calculated using the method of least squares. This slope will be negative in value. The tire's wear rate is defined as the absolute value of the slope of the regression line.

(2) *Two-Point Arithmetical Method.* For each course monitoring and candidate tire in the convoy, using the average tread depth measurements obtained in accordance with paragraph (e) (2) (vi) and (e)(2)(viii)(F) of this section and the corresponding mileages as data points, determine the slope (m) of the tire's wear in mils of thread depth per 1,000 miles by the following formula:

$$m = \frac{1000\ (Y1\text{-}Yo)}{(X1\text{-}Xo)}$$

where:

Yo = average tread depth after break-in, mils

Y1 = average tread depth at 6,400 miles, mils

Xo = omiles (after break-in).

X1 = 6,400 miles of travel

This slope (m) will be negative in value. tire's wear rate is defined as the slope (m) expressed in mils per 1000 miles.

(B) Average the wear rates of the four course monitoring tires as determined in accordance with paragraph (e)(2)(ix)(A) of this section.

(C) Determine the course severity adjustment factor by dividing the base wear rate for the course monitoring tires (see note below) by the average wear rate for the four course monitoring tires.

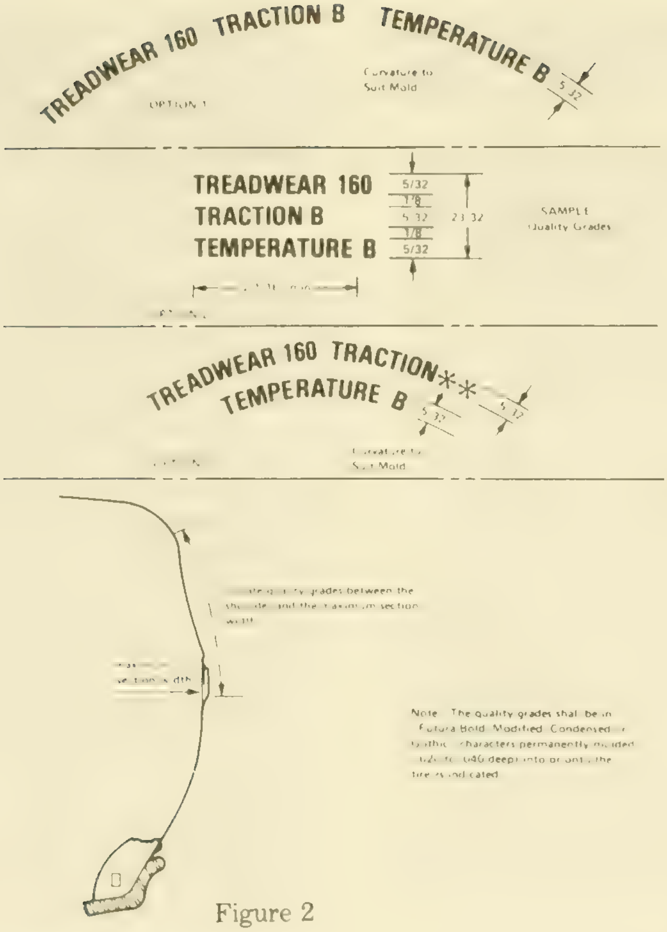


Figure 2

[Part 1] DOT Quality Grades

Treadwear

The treadwear grade is a comparative rating based on the wear rate of the tire when tested under controlled conditions on a specified government test course. For example, a tire graded 150 would wear one and a half (1½) times as well on the government course as a tire graded 100. The relative performance of tires depends upon the actual conditions of their use, however, and may depart significantly from the norm due to variations in driving habits, service practices, and differences in road characteristics and climate.

Traction

The traction grades, from highest to lowest, are A, B, and C, and they represent the tire's ability to stop on wet pavements as measured under controlled conditions on specified government test surfaces of asphalt and concrete. A tire marked C may have poor traction performance. *WARNING:* The traction grade assigned to this tire is based on braking (straightahead) traction tests and does not included cornering (turning) traction.

Temperature

The temperature grades of A (the highest), B, and C, representing the tire's resistance to the generation of heat and its ability to dissipate heat when tested under controlled conditions on a specified indoor laboratory test wheel. Sustained high temperature can cause the material of the tire to degenerate and reduce tire life, and excessive temperature can lead to sudden tire failure. The grade C corresponds to a level of performance which all passenger car tires must meet under the Federal Motor Vehicle Safety Standard No. 109. Grades B and A represent higher levels of performance on the laboratory test wheel than the minimum required by law. *WARNING:* The temperature grade for this tire is established for a tire that is properly inflated and not overloaded. Excessive speed, under-inflation, or excessive loading either separately or in combination, can cause heat buildup and possible tire failure.

[Part II] All Passenger Car Tires Must Conform to Federal Safety Requirements in Addition to These Grades.

NOTE: The base wear rates for the course monitoring tires will be furnished to the purchaser at the time of purchase.

(d) Determine the adjusted wear rate for each candidate tire by multiplying its wear rate determined in accordance with paragraph (e)(2)(ix)(A) of this section by the course severity adjustment factor determined in accordance with paragraph (e)(2)(ix)(C) of this section.

(E) Determine the projected mileage for each candidate tire by applying the appropriate formula set forth below:

(1) If the projected mileage is calculated pursuant to (e)(2)(ix)(a)(1), then

$$\text{Projected mileage} = \frac{1000\ (a-62)}{b'} + 800$$

where:

a = y intercept of regression line (reference tread depth) for the candidate tire as determined in accordance with paragraph (e) (2) (ix) (A) of this section.

b′ = the adjusted wear rate for the candidate tire as determined in accordance with paragraph (e) (2) (ix) (D) of this section.

(2) If the projected mileage is calculated pursuant to (e)(2)(ix)(a)(2), then:

$$\text{Projected mileage} = \frac{1000\ (Yo-62)}{mc} + 800$$

where:

Yo = average tread depth after break-in, mils.

mc⁵the adjusted wear rate for the candidate tire as determined in accordance with paragraph (e) (2) (ix) (D) of this section.

(F) Compute the percentage of the NHTSA nominal treadwear value for each candidate tire using the following formula:

$$P = \frac{\text{Projected Mileage}}{30{,}000} \times 100$$

Round off the percentage to the nearest lower 10% increment. **(55 F.R. 47765—November 15, 1990. Effective December 15, 1990)]**

(iv) The test apparatus is a test trailer built in conformity with the specifications in paragraph 3, "Apparatus," of ASTM Method E 274–79, and instrumented in accordance with paragraph 3.3.2 of that Method, except that "wheel load" in paragraph 3.2.2 and tire and rim specifications in paragraph 3.2.3 of that Method are as specified in the procedures in paragraph (f) (2) of this section for standard and candidate tires.

(v) The test apparatus is calibrated in accordance with ASTM Method F 377–74, "Standard Method for Calibration of Braking Force for Testing of Pneumatic Tires" with the trailer's tires inflated to 24 psi and loaded to 1,085 pounds.

(vi) Consecutive tests on the same surface are conducted not less than 30 seconds apart.

(vii) A standard tire is discarded in accordance with ASTM Method E 501.

(2) *Procedure.* (i) Prepare two standard tires as follows:

(A) Condition the tires by running them for 200 miles on a pavement surface.

(B) Mount each tire on a rim of design or measuring rim width specified for tires of its size in accordance with 49 CFR 571.109, § 4.4.1(a) or (b), or a rim having a width within −0 to +0.50 inches of the width listed. Then inflate the tire to 24 psi, or, in the case of a tire with inflation pressure measured in kilopascals, to 180 kPa.

(C) Statically balance each tire-rim combination.

(D) Allow each tire to cool to ambient temperature and readjust its inflation pressure to 24 psi, or, in the case of a tire with inflation pressure measured in kilopascals, to 180 kPa.

(ii) Mount the tires on the test apparatus described in paragraph (f) (1) (iv) of this section and load each tire to 1,085 pounds.

(iii) Tow the trailer on the asphalt test surface specified in paragraph (f) (1) (i) of this section at a speed of 40 mph, lock one trailer wheel, and record the locked-wheel traction coefficient on the tire associated with that wheel between 0.5 and 1.5 seconds after lockup.

(iv) Repeat the test on the concrete surface, locking the same wheel.

(v) Repeat the tests specified in paragraphs (f) (2) (iii) and (f) (2) (iv) of this section for a total of 10 measurements on each test surface.

(vi) Repeat the procedures specified in paragraphs (f) (2) (iii) through (f) (2) (v) of this section, locking the wheel associated with the other tire.

(vii) Average the 20 measurements taken on the asphalt surface to find the standard tire traction coefficient for the asphalt surface.

Average the 20 measurements taken on the concrete surface to find the standard tire traction coefficient for the concrete surface. The standard tire traction coefficient so determined may be used in the computation of adjusted traction coefficients for more than one candidate tire.

(viii) Prepare two candidate tires of the same construction type, manufacturer, line, and size designation in accordance with paragraph (f) (2) (i) of this section, mount them on the test apparatus, and test one of them according to the procedures of paragraph (f)(2)(ii) through (v) of this section, except load each tire to 85% of the test load specified in §575.104(h). [For CT tires, the test inflation of candidate tires shall be 230 kPa. **(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)**]

(ix) Compute a candidate tire's adjusted traction coefficient for asphalt (m_a) by the following formula:

m_a = Measured candidate tire coefficient for asphalt + 0.50 − Measured standard tire coefficient for asphalt

(x) Compute a candidate tire's adjusted traction coefficient for concrete (m_c) by the following formula:

m_c = Measured candidate tire coefficient for concrete + 0.35 − Measured standard tire coefficient for concrete

(g) *Temperature resistance grading.* (1) Mount the tire on a rim of design or measuring rim width specified for tires of its size in accordance with 49 CFR 571.109, § 4.4.1(a) or (b) CFR 571.109, § 4.4.1(a) or (b) and inflate it to the applicable pressure specified in Table 1 of this section.

(2) Condition the tire-rim assembly to any temperature up to 95°F for at least 3 hours.

(3) Adjust the pressure again to the applicable pressure specified in Table 1 of this section.

(4) Mount the tire-rim assembly on an axle, and press the tire tread against the surface of a flat-faced steel test wheel that is 67.23 inches in diameter and at least as wide as the section width of the tire.

(5) During the test, including the pressure measurements specified in paragraphs (g) (1) and (g) (3) of this section, maintain the temperature of the ambient air, as measured 12 inches from the edge of the rim flange at any point on the circumference on either side of the tire at any temperature up to 95°F. Locate the temperature sensor so that its readings are not affected by heat radiation, drafts, variations in the temperature of the surrounding air, or guards or other devices.

(6) Press the tire against the test wheel with a load of 88 percent of the tire's maximum load rating as marked on the tire sidewall.

(7) Rotate the test wheel at 250 rpm for 2 hours.

(8) Remove the load, allow the tire to cool to 95°F or for 2 hours, whichever occurs last, and readjust the inflation pressure to the applicable pressure specified in Table 1 of this section.

Table 1.—Test Inflation Pressures

Maximum permissible inflation pressure for the following test:

Test Type	*lbs/in²*				*kPa*				[*kPa (1)*			
	32	*36*	*40*	*60*	*240*	*280*	*300*	*340*	*290*	*330*	*350*	*390*
[Treadwear test]	24	28	32	52	180	220	180	220	230	270	230	270
Temperature resistance test]	30	34	38	58	220	260	220	260	270	310	270	310]
[(1) For CT tires only]												

(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)

(9) Reapply the load and without interruption or readjustment of inflation pressure, rotate the test wheel at 375 rpm for 30 minutes, and then at successively higher rates in 25 rpm increments, each for 30 minutes, until the tire has run at 575 rpm for 30 minutes, or to failure, whichever occurs first.

(h) *Determination of test load.* [(1) To determine test loads for purposes of paragraphs (e) (2) (iii) and (f) (2) (viii), follow the procedure set forth in paragraphs (h) (2) through (5) of this section.

(2) Determine the tire's maximum inflation pressure and maximum load rating both as specified on the tire's sidewall.

(3) Determine the appropriate multiplier corresponding to the tire's maximum inflation pressure, as set forth in Table 2.

(4) Multiply the tire's maximum load rating by the multiplier determined in paragraph (3). This is the tire's calculated load.

(5) Round the product determined in paragraph (4) (the calculated load) to the nearest multiple of ten pounds or, if metric units are used, 5 kilograms. For example, 903 pounds would be rounded to 900 and 533 kilograms would be rounded to 535. This figure is the test load.

Table 2 [1]

Maximum Inflation Pressure	*Muliplier to be used for treadwear testing*	*Multiplier to be used for traction testing*
[32 lbs/in²	.851	.851
36 lbs/in²	.870	.797
40 lbs/in²	.883	.753
240 kPa	.866	.866
280 kPa	.887	.804
300 kPa	.866	.866
340 kPa	.887	.804
290 kPa (1) ...	.866	.866
330 kPa (1) ...	.887	.804
350 kPa (1) ...	.866	.866
390 kPa (1) ...	.887	.804

(1) For CT tires only]

[1] Prior to July 1, 1984, the multipliers in the above table are not to be used in determining loads for the tire size designations listed below in Table 2A. For those designations, the load specifications in that table shall be used in UTQG testing during that period. These loads are the actual loads at which testing shall be conducted and should not be multiplied by the 85 percent factors specified for treadwear and traction testing.

(55 F.R. 49618—November 30, 1990. Effective: December 31, 1990)

Table 2A

Tire Size Designation	*Temp Resistance*			*Traction*	*Treadwear*		
	Max Pressure				*Max Pressure*		
	32	*36*	*40*		*32*	*36*	*40*
145/70 R13	615	650	685	523	523	553	582
155/70 R13	705	740	780	599	599	629	663
165/70 R13	795	835	880	676	676	710	748
175/70 R13	890	935	980	757	757	795	833
185/70 R13	990	1040	1090	842	842	884	926
195/70 R13	1100	1155	1210	935	935	982	1029
155/70 R14	740	780	815	629	629	663	693
175/70 R14	925	975	1025	786	786	829	871
185/70 R14	1045	1100	1155	888	888	935	982
195/70 R14	1155	1220	1280	982	982	1037	1088
155/70 R15	770	810	850	655	655	689	723
175/70 R15	990	1040	1090	842	842	884	927
185/70 R15	1100	1155	1210	935	935	982	1029
5.60–13	725	810	880	616	616	689	748
5.20–14	695	785	855	591	591	667	727
165–15	915	1015	1105	779	779	863	939
185/60 R13	845	915	980	719	719	778	833

[(i) *Effective dates for treadwear grading requirements for radial tires.*

(1) Treadwear labeling requirements of §575.104 (d)(1)(i)(B)(2) apply to tires manufactured on or after April 1, 1985.

(2) Requirements for NHTSA review of treadwear information in consumer brochures, as specified in paragraph 575.6(d)(2), are effective April 1, 1985.

(3) Treadwear consumer information brochure requirements of paragraph 575.6(c) are effective May 1, 1985.

(6) Treadwear sidewall molding requirements of §575.104(d)(1)(i)(A) apply to tires manufactured on or after September 1, 1985.

(j) *Effective dates for treadwear grading requirements for bias ply tires.*

(1) Treadwear labeling requirements of §575.104 (d)(1)(i)(B)(2) apply to tires manufactured on or after December 15, 1984.

(2) Requirements for NHTSA review of treadwear information in consumer brochures, as specified in paragraph 575.6(d)(2), are effective December 15, 1984.

(3) Treadwear consumer information brochure requirements of paragraph 575.6(c) are effective January 15, 1985.

(4) Treadwear sidewall molding requirements of §575.104(d)(1)(i)(A) apply to tires manufactured on or after May 15, 1985.

(k) *Effective dates for treadwear grading requirements for bias belted tires.*

(1) Treadwear labeling requirements of §575.104 (d)(1)(i)(B)(2) apply to tires manufactured on or after March 1, 1985.

(2) Requirements for NHTSA review of treadwear information in consumer brochures, as specified in paragraph 575.6(d)(2), are effective March 1, 1985.

(3) Treadwear consumer information brochure requirements of paragraph 575.6(c) are effective April 1, 1985.

(4) Treadwear sidewall molding requirements of §575.104(d)(1)(i)(A) apply to tires manufactured on or after August 1, 1981.

(l) *Effective date for treadwear information requirements for vehicle manufacturers.*

Vehicle manufacturer treadwear information requirements of §§575.6(a) and 575.104(d)(1)(iii) are effective September 1, 1985. **(49 F.R. 49293—December 19, 1984. Effective: see Preamble to Docket No. 25; Notice 58)]**

§ 575.105 Utility Vehicles

(a) *Purpose and scope.* This section requires manufacturers of utility vehicles to alert drivers that the particular handling and manuvering characteristics of utility vehicles require special driving practices when those vehicles are operated on paved roads.

(b) *Application.* This section applies to multipurpose passenger vehicles (other than those which are passenger car derivatives) which have a wheelbase of 110 inches or less and special features for occasional off-road operation ("Utility vehicles").

(c) *Required information.* Each manufacturer shall prepare and affix a vehicle sticker as specified in paragraph 1 of this subsection and shall provide in the vehicle Owner's Manual the information specified in paragraph 2 of this subsection.

(1) A sticker shall be permanently affixed to the instrument panel, windshield frame, driver's side sun visor, or in some other location in each vehicle prominent and visible to the driver. The sticker shall be printed in a typeface and color which are clear and conspicuous. The sticker shall have the following or similar language:

This is a multipurpose passenger vehicle which will handle and maneuver differently from an ordinary passenger car, in driving conditions which may occur on streets and highways and off road. As with other vehicles of this type, if you make sharp turns or abrupt maneuvers, the vehicle may rollover or may go out of control and crash. You should read driving guidelines and instructions in the Owner's Manual, and WEAR YOU SEATBELTS AT ALL TIMES.

The language on the sticker required by paragraph (1) and in the Owner's Manual, as required in paragraph (2), may be modified as is desired by the manufacturer to make it appropriate for a specific vehicle design, to ensure that

consumers are adequately informed concerning the unique propensities of a particular vehicle model.

(2) (i) The vehicle Owner's Manual shall include the following statement in its introduction.

As with other vehicles of this type, failure to operate this vehicle correctly may result in loss of control or an accident. Be sure to read "on-pavement" and "off-road" driving guidelines which follow.

(ii) The vehicle Owner's Manual shall include the following or similar statement:

Utility vehicles have higher ground clearance and a narrower track to make them capable of performing in a wide variety of off-road applications. Specific design characteristics give them a higher center of gravity than ordinary cars. An advantage of the higher ground clearance is a better view of the road allowing you to anticipate problems. They are not designed for cornering at the same speeds as conventional 2-wheel drive vehicles any more than low-slung sports cars are designed to perform satisfactorily under off-road conditions. If at all possible, avoid sharp turns or abrupt maneuvers. As with other vehicles of this type, failure to operate this vehicle correctly may result in loss of control or vehicle rollover.

§ 575.106 Deleted

34 F.R. 8112
May 23, 1969

PREAMBLE TO AN AMENDMENT TO PART 586

Reporting Compliance with Phasing-in of Dynamic Side Impact Test Requirements
(Docket 88-06; Notice 10)
RIN 2127-AB86

ACTION: Final rule.

SUMMARY: This notice establishes reporting and recordkeeping requirements necessary for NHTSA to enforce the phasing-in of the new dynamic test requirements in the amended Standard No. 214. *Side Impact Protection,* which appears elsewhere in today's *Federal Register*. NHTSA proposed on January 27, 1988 to establish such reporting requirements.

DATES: The amendments made by this final rule to the *Code of Federal Regulations* are effective November 29, 1990, except for the information collection requirements. These information collection requirements have not been approved by the Office of Management and Budget (OMB) and are not effective until OMB has approved them. NHTSA will issue a notice in the future extablishing an effective date for the information collection requirements.

SUPPLEMENTARY INFORMATION:

I. Background

On January 27, 1988, NHTSA proposed to amend Standard No. 214 to supplement the existing quasi-static test procedures and performance requirements with dynamic test procedures and performance requirements for passenger cars. The proposed test procedure was a dynamic simulation of a vehicle striking a car in the side in a typical intersection side impact crash. Elsewhere in today's *Federal Register* NHTSA adopts the final rule amending Standard No. 214. Two alternative compliance schedules are established, the choice of which is at the option of the manufacturer. Under the first schedule, each manufacturer of passenger cars will have to meet the new side impact performance requirements based on the following phase-in schedule:

10 percent of automobiles manufactured during the 12 month period beginning September 1, 1993.

25 percent of automobiles manufactured during the 12 month period beginning September 1, 1994.

40 percent of automobiles manufactured during the 12 month period beginning September 1, 1995; and

All automobiles manufactured on or after September 1, 1996. Under the other schedule, no compliance will be required during the production year beginning September 1, 1993, but full implementation will be required effective September 1, 1994.

NHTSA stated in the preamble of the proposed side impact rule that it was proposing to adopt reporting and recordkeeping requirements to facilitate implementation of the dynamic side impact requirements. NHTSA further stated that the proposed reporting and recordkeeping requirements would be similar to those adopted in connection with the phase-in of the automatic restraint requirements for passenger cars in Standard No. 208. *Occupant Crash Protection.* NHTSA did not receive any comments regarding the proposed reporting and recordkeeping requirements for the side impact phase-in.

II. Description of the Final Rule

NHTSA is adopting reporting and recordkeeping requirements almost identical to those adopted for Standard No. 208. Under this rule, manufacturers are required to submit reports to NHTSA for each of the side impact phase-in periods. Each report, covering production during a 12-month period beginning September 1 and ending August 31, would be required to be submitted within 60 days after the end of that period. Three reports would have to be filed. The filing deadlines would be 60 days after (1) August 31, 1994, (2) August 31, 1995 and (3) August 31, 1996.

Information required in each report includes a statement regarding whether or not the manufacturer complied with the phase-in and the basis for that statement. If a manufacturer chooses the second compliance option (i.e., none of their fleet must meet the requirements the first year of the phase-in, but all of their fleet must meet the requirements the second and third years of the phase-in), the manufacturer would state this in the report due 60 days after August 31, 1994. Manufacturers would also have to include the following information in their reports (except the report due 60 days after August 31, 1994 for manufacturers who choose

the second compliance option): the number of passenger cars manufactured for sale in the United States for each of the three previous 12-month production periods; the actual number of passenger cars manufactured during the reporting production period that meet the requirements of the amended Standard No. 214; and brief information about any express written contracts in which manufacturers of passenger cars produced by more than one manufacturer determine which manufacturer would count the cars as its own during a given year of the phase-in of Standard No. 214.

The reporting requirements adopted in this rule are necessary for the three-year period of the phase-in of the new test procedures and performance requirements under Standard No. 214. The information specified by the requirements will enable the agency to carry out its statutory duty to monitor compliance with the Federal motor vehicle safety standards. During the phase-in, only a certain percentage of vehicles are required to meet the new requirements of Standard No 214. It would be virtually impossible for NHTSA to determine if the appropriate percentage of passenger cars has met the new requirements of Standard No. 214 unless manufacturers provide production information to the agency. Thus, NHTSA is requiring manufacturers to report information on both the total number of cars produced and the number of cars produced that meet the requirements of the revised Standard No. 214. NHTSA is requiring reporting of the number of cars manufactured for sale in the United States during each of the three previous 12-month production periods because Standard No. 214 allows manufacturers the option of using the average production volume during the last three production years to determine the number of cars that must meet the requirements of the revised Standard No. 214. Manufacturers are required to provide a statement regarding whether or not they complied with the phase-in and the basis for that statement. This provision requires a manufacturer to show that they produced the requisite percentage of cars that meet the dynamic testing and performance requirements of the revised Standard No. 214. This percentage could be based on either that 12-month production volume or the average production volume for the three previous 12-month production periods.

This rule also requires manufacturers to report brief information about any express written contracts concerning passenger cars produced by more than one manufacturer. In the revised Standard No. 214, published elsewhere in today's *Federal Register*, NHTSA explains which company generally will be considered the manufacturer of a car that is manufactured by two or more companies or manufactured by one company and imported by another. The Standard generally attributes a car to the manufacturer which is most responsible for the existence of the vehicle in the United States. Thus, a car is generally attributed to the company which imported the vehicle; manufactured the vehicle for its own account as part of a joint venture; or marketed the vehicle. However, NHTSA also gives manufacturers the flexibility to determine contractually which manufacturer would count the car as its own toward the required percentage for a given year of the phase-in. That provision of Standard No. 214 is based on an almost identical provision in Standard No. 208.

This rule also includes a provision allowing manufacturers to request an extension of the deadline for filing a report. This provision is identical to that in the rule establishing reporting for Standard No. 208. NHTSA does not believe that complying with the requirement that reports be submitted within 60 days after the end of each production year will be a problem for manufacturers (including importers), except in extreme situations. However, to accommodate those situations, NHTSA is allowing manufacturers to seek an extension of the deadline for filing a report, by submitting a request for extension at least 15 days before the report is due. As provided in the rule the filing of a request for an extension does not automatically extend the thime for filing a report. The rule provides that NHTSA will grant such an extension only if the petitioner shows good cause for the extension and if the extension is consistent with the public interest.

The recordkeeping provisions in this final rule require manufacturers to maintain records of the Vehicle Identification Number (VIN) for each passenger car which meets the new dynamic testing and performance requirements of the amended Standard No. 214. This provision is almost identical to one adopted in connection with Standard No. 208. NHTSA is requiring that the information be maintained by manufacturers until December 31, 1998. The purpose of this requirement is to ensure that such information will be available until the completion of any agency enforcement action begun after the final phase-in report is filed in 1996. Manufacturers are not required to keep the VIN information in a separate file. As long as the VIN information is retrievable, it may be stored in any manner that is convenient to a manufacturer.

III. Regulatory Impacts

A. Executive Order 12291

As indicated earlier in this preamble, this rule supplements a separate final rule establishing new test procedures and performance requirements for side impact under Standard No. 214. This rule establishing reporting and recordkeeping requirements in connection with the phase-in of the new requirements of Standard No. 214 is part of that rulemaking. As such, it is considered a major rule within the meaning of Executive Order 12291. It is also considered to be significant within the meaning of the Department of Transportaiton's regulatory policies and prodedures.

NHTSA has prepared a Final Regulatory Impact Analysis, which describes the economic and other effects of the entire rulemaking. This analysis is available in the docket for the side-impact rulemaking. NHTSA anticipates that the reporting and recordkeeping requirements will have a minimal impact on manufacturers.

B. Regulatory Flexibility Act

NHTSA has also considered the effects of this rulemaking under the Regulatory Flexibility Act. I hereby certify that this final rule will not have a significant economic impact on a substantial number of small entities. Therefore, NHTSA has not prepared a regulatory flexibility analysis. Few, if any, passenger car manufacturers are considered small entities. Small organizations or governmental units will not likely be significantly affected. Any price increases associated with this final rule will be modest and should not affect the purchasing of new cars by these entities. Accordingly. no regulatory flexibility analysis has been prepared. The impact of the rest of the side impact rulemaking is discussed in other notices.

C. Paperwork Reduction Act

The reporting and recordkeeping requirements in this rule are considered to be information collection requirements, as that term is defined by the Office of Management and Budget (OMB) in 5 CFR Part 1320. Accordingly, these requirements have been submitted to the OMB for its approval under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). A notice will be published in the *Federal Register* when OMB makes its decision on this request.

List of Subjects in 49 CFR Part 586

PART 586

In Consideration of the foregoing. Chapter V, Title 49, Transportation, the *Code of Federal Regulations* is amended by adding a new Part 586 to read as follows:

PART 586
Side Impact Phase-in Reporting Requirements

Sec.
586.1 Scope.
586.2 Purpose.
586.3 Applicability.
586.4 Definitions.
586.5 Reporting requirements.
586.6 Records.
586.7 Petition to extend period to file report.

Authority: 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.50.

§ 586.1 Scope.

This section establishes requirements for passenger car manufacturers to submit a report, and maintain records related to the report concerning the number of passenger cars manufactured that meet the dynamic test procedures and performance requirements of Standard No. 214, *Side Impact Protection* (49 CFR Part 571.214).

§ 586.2 Purpose.

The purpose of the reporting requirements is to aid the National Highway Traffic Safety Administration in determining whether a passenger car manufacturer has complied with the requirements of Standard No. 214 of this Chapter (49 CFR 571.214) concerning dynamic test procedures and performance requirements concerning side impact protection.

586.3 Applicability.

This part applies to manufacturers of passenger cars.

586.4 Definitions.

(a) All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

(b) "Passenger car" is used as defined in 49 CFR Part 571.3.

(c) "Production year" means the 12-month period between September 1 of one year and August 31 of the following year, inclusive.

586.5 Reporting requirements.

(a) *General reporting requirements.* Within 60 days after the end of each of the production years ending August 31, 1994, August 31, 1995, and August 31, 1996, each manufacturer shall submit a report to the National Highway Traffic Safety Administration concerning its compliance with the requirements of S3(c) of Standard No. 214 for its passenger cars produced in that year. Each report shall—

(1) Identify the manufacturer;

(2) State the full name, title, and address of the official responsible for preparing the report;

(3) Identify the production year being reported on;

(4) Contain a statement regarding whether or not the manufacturer complied with the dynamic testing and performance requirements of the amended Standard No. 214 for the period covered by the report and the basis for that statement;

(5) Provide the information specified in § 586.5(b), except that this information need not be submitted with the report due 60 days after August 31, 1994 if the manufacturer chooses the compliance option specified in S3(d) of 49 CFR 571.214;

(6) Be written in the English language, and

(7) Be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington. D.C. 20590.

(b) *Report content—(1) Basis for phase-in production goals.* Each manufacturer shall provide the number of passenger cars manufactured for sale in the United States for each of the three previous production years, or, at the manufacturer's option, for the current production year. A new manufacturer that is, for the first time, manufacturing passenger cars for sale in the United States must report the number of passenger cars manufactured during the current production year.

(2) *Production.*

Each manufacturer shall report for the production year being reported on, and each preceding production year, to the extent that cars produced during the preceding years are treated under Standard No. 214 as having been produced during the production year being reported on, information on the number of passenger cars that meet the dynamic test procedure and performance requirements of S5 and S6 of Standard No. 214.

(3) *Passenger cars produced by more than one manufacturer.* Each manufacturer whose reporting of information is affected by one or more of the express written contracts permitted by S8.4.2 of Standard No. 214 shall:

(i) Report the existence of each contract, including the names of all parties to the contract, and explain how the contract affects the report being submitted.

(ii) Report the actual number of passenger cars covered by each contract.

§ *586.6 Records.*

Each manufacturer shall maintain records of the Vehicle Identification Number for each passenger car for which information is reported under § 586.5(b)(2) until December 31, 1997.

§ *586.7 Petition to extend period to file report.*

A petition for extension of the time to submit a report must be received not later than 15 days before expiration of the time stated in §586.5(a). The petition must be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, D.C. 20590. The filing of a petition does not automatically extend the time for filing a report. A petition will be granted only if the petitioner shows good cause for the extension and if the extension is consistent with the public interest.

Issued on: October 24, 1990.

Jerry Ralph Curry
Administrator

55 F.R. 45768
October 30, 1990

PART 586—SIDE IMPACT PHASE-IN REPORTING REQUIREMENTS

§ 586.1 Scope. This section establishes requirements for passenger car manufacturers to submit a report, and maintain records related to the report, concerning the number of passenger cars manufactured that meet the dynamic test procedures and performance requirements of Standard No. 214, *Side Impact Protection* (49 CFR Part 571.214).

§ 586.2 Purpose. The purpose of the reporting requirements is to aid the National Highway Traffic Safety Administration in determining whether a passenger car manufacturer has complied with the requirements of Standard No. 214 of this Chapter (49 CFR 571.214) concerning dynamic test procedures and performance requirements concerning side impact protection.

§ 586.3 Applicability. This part applies to manufacturers of passenger cars.

§ 586.4 Definitions. (a) All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

(b) "Passenger car" is used as defined in 49 CFR Part 571.3.

(c) "Production year" means the 12-month-period between September 1 of one year and August 31 of the following year, inclusive.

§ 586.5 Reporting requirements.

(a) *General reporting requirements.* Within 60 days after the end of each of the production years ending August 31, 1994, August 31, 1995, and August 31, 1996, each manufacturer shall submit a report to the National Highway Traffic Safety Administration concerning its compliance with the requirements of S3(c) of Standard No. 214 for its passenger cars produced in that year. Each report shall—

(1) Identify the manufacturer.

(2) State the full name, title, and address of the official responsible for preparing the report;

(3) Identify the production year being reported on;

(4) Contain a statement regarding whether or not the manufacturer complied with the dynamic testing and performance requirements of the amended Standard No. 214 for the period covered by the report and the basis for that statement;

(5) Provide the information specified in § 586.5(b), except that this information need not be submitted with the report due 60 days after August 31, 1994 if the manufacturer chooses the compliance option specified in S3(d) of 49 CFR 571.214;

(6) Be written in the English language; and

(7) Be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

(b) *Report content—*

(1) *Basis for phase-in production goals.* Each manufacturer shall provide the number of passenger cars manufactured for sale in the United States for each of the three previous production years, or, at the manufacturer's option, for the current production year. A new manufacturer that is, for the first time, manufacturing passenger cars for sale in the United States must report the number of passenger cars manufactured during the current production year.

(2) *Production.*

Each manufacturer shall report for the production year being reported on, and each preceding year, to the extent that cars produced during the preceding years are treated under Standard No. 214 as having been produced during the production year being reported on, information on the number of passenger cars that meet the dynamic test procedure and performance requirements of S5 and S6 of Standard No. 214.

(3) *Passenger cars produced by more than one manufacturer.*

Each manufacturer whose reporting of information is affected by one or more of the express

written contracts permitted by S8.4.2. of Standard No. 214 shall:

(i) Report the existence of each contract, including the names of all parties to the contract, and explain how the contract affects the report being submitted.

(ii) Report the actual number of passenger cars covered by each contract.

§ 586.6 Records.

Each manufacturer shall maintain records of the vehicle Identification Number for each passenger car for which information is reported under § 586.5(b)(2) until December 31, 1997.

§ 586.7 Petition to extend period to file report.

A petition for extension of the time to submit a report must be received not later than 15 days before expiration of the time stated in § 586.5(a). The petition must be submitted to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The filing of a petition does not automatically extend the time for filing a report. A petition will be granted only if the petitioner shows good cause for the extension and if the extension is consistent with the public interest.

55 F.R. 45768
October 30, 1990

PREAMBLE TO AN AMENDMENT TO PART 587

Moving Deformable Barrier
(Docket 88-06; Notice 9)
RIN 2127-AB86

ACTION: Final rule.

SUMMARY: This notice establishes specifications for the weight dimensions, stiffness, and other attributes of the moving deformable barrier that is to be used in the dynamic, barrier-to-car crash test specified under the amendments to Standard No. 214, *Side Impact Protection*, which appear elsewhere in today's *Federal Register*. NHTSA proposed the specifications for the moving deformable barrier on January 27 1988

DATES: The amendments made by this final rule to the *Code of Federal Regulations* are effective November 29, 1990. However, the substantive requirements of the revised Standard No. 214 are phased in over a three-year period beginning on September 1, 1993. Compliance will be required for all new cars manufactured on or after September 1, 1996.

SUPPLEMENTARY INFORMATION:

I. Background

On January 27, 1988, NHTSA proposed to amend Standard No. 214 to supplement the existing quasi-static test procedures and performance requirements with dynamic test procedures and performance requirements for passenger cars. The proposed test procedure was a dynamic simulation of a vehicle striking a car in the side in a typical intersection side impact crash. That notice also proposed to use a moving deformable barrier (MDB) developed by NHTSA in the proposed test procedure. The barrier was described in the preamble of the proposed rule and complete design drawings of the MDB were placed in a rulemaking docket and were available for public comment.

Elsewhere in today's *Federal Register* NHTSA publishes a final rule adopting the dynamic test amendments to Standard No. 214. Under that rule, two alternative compliance schedules are established, the choice of which is at the option of the manufacturer.

Under the first schedule, each manufacturer of passenger cars will have to meet the new side impact performance requirements based on the following phase-in schedule:

10 percent of automobiles manufactured during the 12 month period beginning September 1, 1993;

25 percent of automobiles manufactured during the 12 month period beginning September 1, 1994;

40 percent of automobiles manufactured during the 12 month period beginning September 1, 1995; and all automobiles manufactured on or after September 1, 1996. Under the other schedule, no compliance will be required during the production year beginning September 1, 1993, but full implementation will be required effective September 1, 1994.

This notice describes the MDB that is to be used for the new test procedures established as part of the amendments to Standard No. 214. The description of the MDB will be codified in a new Part 587, *Moving Deformable Barrier*, The MDB adopted in this final rule is the same as the one described in the January 27, 1988 proposal to amend Standard No 214.

II. Description of the Moving Deformable Barrier

The MDB described in this rule is a steel structure with a 102 inch wheelbase, a 63 inch track width, and two aluminum honeycomb blocks on the front. This latter feature is to simulate the energy absorption characteristics of a striking vehicle. One block has a high compression strength of 245 pounds per square inch (psi), is 4 inches by 8 inches by 66 inches and its centerline is mounted 17 inches above the ground to simulate the bumper/frame of the striking vehicle. The other honeycomb block has considerably lower compressive strength (45 psi), is 15 inches by 22 inches by 66 inches, and is used to simulate the softer, front-end structure of the striking vehicle. The front and rear wheels of the MDB can be turned to accommodate the impact angle specified in amended Standard No. 214.

The following are the inertial properties of the NHTSA MDB in configuration 2 (with two cameras and camera mounts and a light trap vane and ballast reduced). The weight is 3,015 pounds, the track width is 63 inches, and the wheelbase is 102 inches.

The center of gravity is as follows:

X = 44.2 inches rear of front axle
Y = 0.3 inches left of longitudinal center line
Z = 19.7 inches from ground.

The moments of inertia are as follows:

Pitch = 1669 ft-lb-sec^2
Roll = 375 ft-lb-sec^2
Yaw = 1897 ft-lb-sec^2

The drawings and specifications for the MDB, which are incorporated by reference in the final rule, specify the use of Narmco 117 bonding film, or an equivalent, for bonding the honeycomb structure of the MDB. NHTSA understands that Narmco 117 bonding film meets the minimum requirements for Type I Class 2 adhesives under the Military Specification for Adhe-

sives under the Military Specification for Adhesive. Film Form, Metallic Structural Sandwich Construction (MIL-A-25463b, March 31, 1982). Any adhesive which has characteristics equivalent to those of the Narmco 117 bonding film may be used for bonding the honeycomb structure. This would include but is not necessarily limited to, those adhesives which meet the Type I Class 2 requirements under the Military Specification.

III. Brief Summary of Comments on Proposed MDB

NHTSA received many comments concerning the MDB. The following briefly summarizes those comments. NHTSA more fully summarizes and responds to the comments later in this notice and in the Final Regulatory Impact Analysis. A number of commenters advocated the adoption of one of the barriers developed in Europe instead of the NHTSA MDB. Some commenters favored the barrier developed by the European Experimental Vehicle Committee (EEVC), while others favored the barrier developed by the Committee of Common Market Automobile Constructors (CCMC).

A number of commenters suggested a different weight for the MDB. Some commenters thought that the weight should be increased to be more consistent with the weight of the average light truck. Others supported a lower barrier weight, more consistent with the weight of the barriers developed in Europe.

Some commenters suggested a different height for the bumper of the MDB. Some recommended a bumper height similar to that of a light truck.

A number of commenters criticized the dimensions of the MDB's honeycomb face. Some commenters suggested a different width or height above the ground. Others preferred the shape and dimensions of a barrier face developed in Europe.

Some commenters were concerned about the stiffness of the aluminum honeycomb barrier face. Some believed that the barrier was stiffer than the majority of passenger cars and thought that the barrier should be more representative of passenger cars. Others suggested that NHTSA consider a rigid moving barrier.

Some commenters also believed that the bumper of the MDB was too stiff. Some commenters supported a dynamic force-deflection specification for the MDB barrier face. A few commenters stated that the variability of the barrier face stiffness can be significant.

IV. Barrier Weight

NHTSA proposed a side impact compliance test procedure which simulates a typical two-vehicle side impact collision and employs a 3,000 pound MDB as the striking or "bullet" vehicle. As discussed in the proposal, NHTSA set the weight of the barrier to be representative of the weight of future vehicles expected to be involved as the striking vehicle in side impact crashes in the United States. In the proposal, NHTSA stated that in multiple vehicle accidents resulting in serious injuries and fatalities, passenger cars and light/medium/heavy trucks are about equally likely to be the striking vehicle. As stated in the proposal, NHTSA derived the weight of the barrier from the median curb weight of passenger cars (3,127 pounds in 1986) and light trucks (3,813 pounds in 1986). This resulted in a weighted average of 3,423 pounds, which was adjusted downward to account for the projected lower weight of vehicles in the 1990s. Based on these considerations, NHTSA derived a barrier weight of 3,000 pounds, representing a 2,700 pound vehicle and 300 pounds for passengers and cargo.

NHTSA believes that it is appropriate to use a barrier weight that is based, in part, on the higher weight of light trucks since light trucks are involved as the striking vehicle in a significant percentage of side impact collisions. NHTSA analyzed Fatal Accident Reporting System (FARS) data from 1984 to 1988 for fatal side impact collisions in which a passenger car was the struck vehicle. Based on this analysis, NHTSA determined that collisions involving passenger cars as the striking vehicle type accounted for 47.4 percent of the fatalities, while striking light trucks/vans (LTV's) accounted for 31.3 percent, and striking medium/heavy duty vehicles accounted for 19 percent of the fatalities. In addition, the percentage of fatalities from side impact collisions with an LTV as the striking vehicle has been increasing. The percentage has grown from 29.7 percent of the fatalities in 1984 to 35.5 percent in 1988. Similarly, LTV's as the striking vehicle accounted for 31 percent of the side impact collision injuries classified as Abbreviated Injury Scale (AIS) 3 or greater in 1988. This percentage has increased from 14.7 percent in 1983.

NHTSA received a number of public comments concerning barrier weight, with a number of commenters suggesting a weight different from that proposed. The Center for Auto Safety and Public Citizen suggested increasing the weight of the MDB to 3,500 pounds to be consistent with the higher average light truck weight. Rolls-Royce stated that if the MDB is intended to represent the aggressiveness of a light truck. a higher weight would be needed. The European Experimental Vehicles Committee (EEVC) supported a lower barrier weight of about 2,425 pounds (1,100 kilograms), closer to the weight of the MDB developed in Europe. The Commission of the European Communities suggested a weight of 950 kilograms (2,095 pounds). Ford stated that the MDB weight should represent the weight of the U.S. vehicle fleet. However, in the interest of harmonization, Ford suggested a compromise weight of 2,425 pounds.

The Motor Vehicle Manufacturers Association (MVMA) noted that different barrier weights within the range of 2,000 to 3,000 pounds do not show a

significant influence on test results. Jaguar questioned how the mass of the barrier was determined, asking if the average weight of the U.S. passenger car fleet had been weighted for the number of vehicles in the vehicle class. Chrysler stated that it did not object to the 3,000 pound weight.

NHTSA reexamined the barrier weight issue, using R. L. Polk registration data and vehicle test weight information from the New Car Assessment Program (NCAP) from 1979 to 1988. The NCAP data base consists of domestically manufactured, European, and Japanese cars, all of which are sold in the U.S. market and represent potential striking vehicles. NHTSA derived registration-weighted average and median fleet weights for 1988 which are stated below. The weight includes vehicle curb weight, two Part 572(B) dummies weighing 164 pounds each. and simulated cargo of 50 to 150 pounds. The average weight of passenger cars was 3,189 pounds, while the median weight was 3,067 pounds. For light trucks the average weight was 3,858 pounds, while the median weight was 3,791 pounds. For the combined fleet of passenger cars and light trucks, the average weight was 3,317 pounds and the median weight was 3,250 pounds.

NHTSA also examined the individual and combined equivalent test weights of 1989 domestic and imported passenger cars and light trucks used in EPA's fuel economy driving cycle. Equivalent test weight is defined as curb weight plus 300 pounds to account for two occupants and cargo. The average equivalent test weight for various vehicle types in model year 1989 is shown below:

Table I

Vehicle Type	*Avg. Equiv. Test Weight*
Passenger cars (PC)	3,181 pounds
PC (imports only)	2,889 pounds
Light trucks and vans (LTV)	3,958 pounds
LTV (imports only)	3,452 pounds
PC and LTV	3,423 pounds

Various European commenters expressed concern about the weight of the MDB proposed by NHTSA. The barrier designs of the European Experimental Vehicles Committee (EEVC) and the Committee of Common Market Automobile Constructors (CCMC) weigh about 1,000 pounds less than the MDB proposed by NHTSA. The European barrier is based on European vehicles which are often smaller and lighter than U.S. vehicles. Thus, the European barrier at 2,095 pounds is not representative of the U.S. passenger car and light truck fleet, which had an average equivalent test weight of about 3,423 pounds in model year 1989.

In the proposal, NHTSA predicted that the average combined weight (curb weight plus 300 pounds) of the passenger car and light truck fleet would be about 3,000 pounds in the mid 1990s. However, the average combined weight of the passenger car and light truck fleet may be higher than this in the mid 1990s. According to EPA figures. the average combined weight of passenger cars and light trucks has stabilized over the last six years at about 3,423 pounds.

After analyzing the comments and the information discussed above, NHTSA concludes that 3,000 pounds is an appropriate weight for the MDB and is representative of the weight of passenger cars and light trucks in the United States fleet. Based on data from NCAP, weighted to reflect registration figures, and 1989 EPA data, weighted to reflect sales, the MDB is six percent lighter than the average passenger car (domestic and imported) and 11 to 14 percent lighter than the average for passenger cars and light trucks combined. If passenger car and light truck weights decline in the future, the MDB weight would be even more representative.

In addition, the difference between a barrier weight of 3,000 pounds and the average combined fleet weight of 3,317 to 3,423 pounds may not be significant. Theoretically, the lighter the striking vehicle the less the kinetic energy which must be absorbed and the less the momentum that will be transferred to the struck vehicle. These reductions, generally result in lower dummy responses and, thus, lower Thoracic Trauma Index (dummy) or TTI(d) values. However, NHTSA examined the sensitivity of side impact dummy responses and TTI(d) to differences in MDB weight for the proposed rule. Comparing the 3,000 pound barrier to an average 3,423 pound weight for the combined passenger car/light truck population, a Department of Transportation computer model (which this notice refers to as the "side impact sensitivity model"), discussed in detail in Section D of the Preliminary Regulatory Impact Analysis, showed that, with a Volkswagen Rabbit as the struck vehicle, rib responses would remain unchanged and the spine and pelvis acceleration responses would be reduced only four percent. Overall, NHTSA expects that the effect on dummy responses of a somewhat lower barrier weight would be negligible.

V. Barrier Shape and Dimensions

The dimensions of the barrier described in the proposal were established using 1979 model year vehicles. The minimum and maximum bumper heights correspond to the sales-weighted median heights for 1979 two-door sedans. other barrier dimensions were based on sales-weighted dimensions from the highest sales volume 1979 model passenger cars, the Ford Fairmont, Oldsmobile Cutlass, Chevrolet Citation and Chevrolet Impala.

Commenters expressed concern about the bumper height, barrier height, and barrier width of the MDB. In the Preliminary Regulatory Impact Analysis, NHTSA stated that these dimensions of the barrier were important because the above ground height and location of the stiffer honeycomb component (the bumper) controls engagement with the door sill of the struck vehicle, the distance below the window opening or barrier height influences the inner and outer door energy absorption and the deflection characteristics needed to lower thorax responses, and the width of the barrier controls front fender and rear quarter panel engagement.

A. Barrier Bumper Height

NHTSA received a number of comments concerning the barrier bumper height. The Insurance Institute for

Highway Safety (IIHS), the Center for Auto Safety, and Public Citizen recommended a bumper height similar to that of a light truck. Rolls-Royce stated that if the MDB is as stiff as a light truck, then it should also have a higher bumper height, like a light truck.

The MDB described in the proposal has an upper edge that is 21 inches off the ground and a bottom edge that is 13 inches off the ground. This represents an eight-inch high bumper surface, which protrudes four inches from the barrier face. As mentioned in the proposal, the bumper face vertical height (the distance between the upper and lower bumper edges) ranged from 4.9 to 7.5 inches for the ten best selling passenger car models in 1984.

NHTSA reexamined the bumoer height issue in light of several sets of current vehicle bumper height data. In two studies. NHTSA measured the distance from the bottom of the bumper to the ground of (1) 19 popular passenger cars from model years 1976 to 1983 and (2) 12 light trucks from model years 1984 to 1988. For the 19 passenger cars, the average measurements were 14.4 inches from the ground to the bottom of the bumper and 20.7 inches from the ground to the top of the bumper. For the 12 light trucks, the average measurements were 16.7 inches from the ground to the bottom of the bumper and 25.8 inches from the ground to the top of the bumper. This compares to the NHTSA MDB, which measures 13.0 inches to the bottom of the bumper and 21.0 inches to the top of the bumper. Based on this data set, the distance to the top edge of the MDB bumper is consistent with the distance to the top edge of the average passenger car bumper, but lower than the average distance for light truck bumpers by 4.8 inches. Based on the same data set, the lower edge of NHTSA's bumper is 1.4 inches lower than the average for passenger cars and 2.7 inches lower than the average for light trucks. The average vertical height of the NHTSA MDB bumper is 8.0 inches, which compares to an average vertical height of 6.1 inches for the 19 passenger cars and 9.1 inches for the 12 light trucks. Based on this data set, the vertical height of the MDB bumper is within the range of popular passenger cars and light trucks.

In addition, NHTSA examined a sample of 36 popular 1987 passenger cars and light trucks and found an average height of 20.8 inches to the top of the bumper. This is consistent with the upper-edge height of the MDB bumper (21.0 inches). NHTSA believes that a larger sample would yield the same results since the Bumper Standard (49 CFR Part 581) specifies a 16 to 20 inch vertical impact position for the pendulum impact strength test for passenger cars.

NHTSA concludes that the upper edge distance of the proposed MDB bumper is consistent with the vehicle population it is intended to represent. NHTSA acknowledges that the vertical height of the MDB bumper may be two to three inches greater than that of the bumper on a typical passenger car. However, NHTSA believes that this is necessary to represent the range of bumper-to-side-structure engagement. NHTSA believes that the MDB bumper will engage the sill and reinforcing structure of a struck vehicle in the same manner as the bumper of a typical striking passenger car or light truck, even if the MDB bumper has a slightly greater vertical height (i.e., the width of the bumper is slightly greater) than the bumper of a typical passenger car or light truck. Damage patterns of the sills in vehicles struck by the NHTSA MDB are similar to those observed in actual side impact crashes.

B. Barrier Height and Width

A number of commenters criticized the dimensions of the MDB's honeycomb face. For example, comments addressed its overall width and height above the ground. General Motors (GM) claimed that the barrier height specifications were ambiguous. The commenter stated that the four specified dimensions cannot be achieved simultaneously because of build tolerance in the barrier face and its attachment. The Commission of the European Communities (CEC) disagreed with the shape and dimensions of the barrier face. The International Standards Organization (ISO) preferred the shape and dimensions of the EEVC barrier face as being more representative of the average front-end size of world passenger cars. The EEVC stated that it would be easier to meet the requirements of the revised Standard No. 214 with the proposed MDB than with the EEVC barrier. because the stronger parts of the car (e.g., pillars) would be struck by the proposed MDB's barrier face. They stated that this would be because the EEVC barrier is not as wide and they were concerned that the EEVC barrier would result in a more severe test, especially with a more rearward positioned point of impact compared to that proposed by NHTSA. The Japanese Automobile Standards Internationalization Center (JASIC) stated that the barrier face should represent the average dimensions of cars throughout the world. The U.S. Technical Research Company, representing Peugeot and Citroen, was concerned that the barrier face geometry did not represent the front face of a light truck. In response to GM's comment, NHTSA added more information concerning specifications. NHTSA notes that several MDB's have been built and tested by manufacturers and testing organizations without apparent difficulties.

NHTSA believes that the MDB should be representative of cars and light trucks in the United States, rather than of world passenger cars. Since the MDB is designed to represent the striking vehicle in a side impact collision in the United States, it is appropriate for it to represent the vehicles likely to be involved in such crashes in the United States.

NHTSA analyzed whether the MDB dimensions are representative of passenger cars and light trucks in the

United States. NHTSA compared the width and height of the MDB to the width and height of passenger cars and 15 light trucks. NHTSA used bumper width measurements from NCAP test vehicles from 1979 to 1988 to reexamine the barrier width issue. The data were weighted to represent 1988 vehicle registrations. NHTSA found that passenger cars had a weighted average width of 67.0 inches and a median width of 66.6 inches. Light trucks had a weighted average width of 71.8 inches and a median width of 70.4 inches. For passenger cars and light trucks combined. the weighted average width was 67.6 inches and the median width was 66.8 inches. This is nearly identical to the NHTSA barrier face width of 66 inches.

NHTSA also compared the height of the MDB to the height of passenger cars and light trucks. NHTSA compared the distance from the top edge of the barrier to the ground, to the distance from the upper hood edge to the ground, in a sample of 36 popular passenger cars and light trucks selected to be representative of 1987 model year passenger cars and light trucks in the United States. In this sample, the upper hood edge averaged 32.2 inches from the ground. The sales weighted average for the upper hood edge height was 33.2 inches. This is nearly identical to the MDB distance of 33 inches.

Based on the above data, NHTSA concludes that the barrier height and width are representative of the average combined passenger car and light truck population. NHTSA further concludes that it is appropriate for the barrier height and width to represent the combined passenger car and light truck population since light trucks are the striking vehicle in a large percentage of side impact collisions.

VI. Barrier Stiffness

The MDB described in the proposal was designed to have the stiffness or crush characteristics of a 1981 Chevrolet Citation striking another vehicle in the side at an angle of 60 degrees. The stiffness or crush characteristics of the MDB are controlled by two aluminum honeycomb blocks. As stated in the preamble to the proposal, these blocks give the MDB an average stiffness of about 10,000 pounds per inch of deflection for a large magnitude of crush at a 90 degree impact angle. NHTSA acknowledged in the proposal that this value is at the upper end of the passenger vehicle scale. However, many light trucks, which represent a significant portion of the striking vehicle population, are in this range of stiffness. In the proposal, NHTSA tentatively concluded that the MDB front face stiffness should be higher than the stiffness of typical passenger car front structures and more like the stiffness of light trucks. This was because light/medium/heavy trucks, as striking vehicles, are responsible for nearly as many serious injuries and fatalities as are passenger cars. NHTSA received many comments concerning barrier stiffness.

A. Overall Barrier Face Stiffness

Many commenters were concerned about the stiffness of the aluminum honeycomb barrier face. Their primary criticism was that the MDB face is too stiff. General Motors commented that a barrier face which is stiffer than the typical car or light truck will result in different interactions with the test vehicles. As an example, GM stated that the deformation of the barrier has been less than five inches in full scale tests conducted by GM. According to GM, this indicates that the purpose of having a deformable barrier is compromised. GM also stated that twice the energy is required to deform the MDB five inches than to deform the GM Astro, the GM Blazer, or the Mazda B-2000 the same amount. According to GM, this is because the MDB is much stiffer than those vehicles during the first five inches of crush. GM also stated that the NHTSA MDB was stiffer than the GM Oldsmobile Delta 88. GM asserted that further work is necessary to make the barrier more representative. Toyota stated that the proposed barrier exceeded the stiffness of full size cars and trucks. Nissan and Porsche also stated that the MDB is too stiff.

Many commenters stated that the stiffness of the barrier should be like that of a passenger car, not that of a light truck. Some commenters stated that the barrier was stiffer than the majority of passenger cars. The Automobile Importers of America (AIA) stated that the barrier should represent the world passenger car fleet. Nissan, the Japanese Automobile Manufacturers Association (JAMA), and Austin-Rover encouraged NHTSA to consider a rigid moving barrier.

GM was the only commenter to submit data generated at its own test facilities concerning barrier stiffness. GM performed 30 mph frontal rigid barrier impact tests and submitted force-deflection curves that it asserted showed that the proposed NHTSA MDB face is stiffer than the front end of the Oldsmobile Delta-88.

In view of these comments, NHTSA reexamined barrier stiffness. In the Final Regulatory Impact Analysis, NHTSA compares the average frontal stiffness (i.e., the average of the stiffness measured over 10 to 12 inches of displacement) and initial frontal stiffness (i.e., stiffness measured during the first five inches of displacement) of the MDB with that of a selected set of passenger cars and light trucks assessed under the agency's New Car Assessment Program (NCAP). NHTSA also examined the front-end stiffness estimates (using NCAP data) at 4, 6, and 8 inches of displacement for a larger set of passenger cars and light trucks provided by CCMC and JAMA in their comments. The frontal stiffness measurements and estimates were based on fixed rigid barrier tests. For the makes and models analyzed, the MDB average stiffness is greater than that of the average passenger car, but less than that of the average light truck. The

initial MDB stiffness is greater than that of both the average passenger car and the average light truck.

As explained in the Final Regulatory Impact Analysis. NHTSA also reexamined barrier stiffness using the root-energy method employed in the damage algorithm in the CRASH3 accident reconstruction model. The modeling shows that the stiffness of the proposed MDB is 45 percent greater than the mean passenger car stiffness and 17 percent greater than the mean LTV stiffness. NHTSA discusses this modeling data in further detail in the Final Regulatory Impact Analysis.

NHTSA agrees that the initial stiffness (i.e., average stiffness during the first five inches of displacement) of the MDB is greater than that of a Chevy Astro, a Chevy Blazer, a Mazda B-2000, or an Oldsmobile Delta 88. However, neither the barrier nor striking vehicles have a constant frontal stiffness. In addition. the frontal stiffness does not change in a linear fashion. When average stiffness is derived from the actual force-deflection curve (which is non-linear) over a 10 to 12 inch crush distance, the first three vehicles are as stiff or stiffer than the NHTSA MDB.

While the MDB has greater initial frontal stiffness than the average car or light truck when measured in a fixed rigid barrier test. NHTSA does not believe that the MDB will always produce higher occupant injury responses in crash tests than passenger cars or light trucks with lesser stiffness. NHTSA believes that this will depend upon the relative stiffness of the struck vehicle. The Department of Transportation side impact sensitivity model predicts that the higher stiffness of NHTSA's MDB may produce TTI(d) responses up to 25 percent higher in certain test vehicles. However, as explained in the Final Regulatory Impact Analysis. NHTSA believes that the side impact sensitivity model has limitations and, therefore, should only be used to investigate general trends of dummy responses rather than to make precise predictions of those responses.

Therefore, NHTSA also analyzed experimental and empirical data to study the impact of the stiffness of the MDB. First, photographs and slides from accident investigation reports show that the front-ends of striking vehicles in side impact collisions do not crush or absorb a great deal of energy. Nearly all of the kinetic energy of the striking vehicle is generally absorbed in the side of the struck vehicle. The NHTSA MDB behaves similarly, yielding very little and absorbing only four to five percent of the crash energy.

Second, Transport Canada conducted a series of side impact crash tests using Chevrolet Cavaliers as the struck vehicle to examine and compare the proposed NHTSA and European side impact test procedures. One test by Transport Canada was car-to-car, where the striker was a 1988 Ford Taurus (weighing 3,003 pounds and crabbed at 26 degrees) and the struck vehicle was a Cavalier. NHTSA plotted the Cavalier's side deformation (plan or top view) caused by NHTSA's proposed MDB and compared it to the deformation caused by the Ford Taurus at five different levels (i.e.. low door sill, occupant H-point, mid-door height, window sill, and top of the window opening). NHTSA found that they were very similar. These data demonstrate the comparability of the Taurus front-end and the MDB with respect to aggressiveness and stiffness. (As used here, aggressiveness describes the amount of deformation or damage caused by the striking vehicle in the side of the struck vehicle. Aggressiveness is also associated with stiffness, i.e.. something that is stiffer is also more aggressive.) The nearly congruent deformation patterns in the Cavalier show that the MDB and the Taurus absorbed about equal amounts of energy. In addition, the front-end of the Ford Taurus showed very little damage, similar to the MDB face.

In view of this empirical data, NHTSA questions the relevancy of frontal stiffness data derived from fixed rigid barrier tests to the frontal stiffness of a striking vehicle in a side impact crash. Relative to the side of a passenger car, front-ends of a striking vehicle (both passenger cars and LTV's) are very aggressive, deform very little, and absorb very little energy. In short, the front-ends of striking vehicles are much stiffer than the sides of struck vehicles.

NHTSA agrees with Ford that the MDB crushes very little in a full scale side impact crash. However, as discussed above, a striking vehicle in a side impact crash also crushes very little.

GM stated that the NHTSA MDB is stiffer than an Oldsmobile Delta-88 and is not representative of typical passenger car frontal stiffness. NHTSA agrees that the NHTSA MDB is stiffer than the average frontal stiffness of a passenger car, measured using a fixed rigid barrier. However, NHTSA believes that this measure of frontal stiffness is not relevant to frontal stiffness in a side impact, where little front-end crush occurs in a striking vehicle. In addition, NHTSA believes that it is somewhat academic whether the proposed NHTSA MDB is stiffer than the Oldsmobile Delta-88. NHTSA believes that the important issue is the relative stiffness of the NHTSA MDB and the front structures of striking vehicles compared to that of struck vehicle side structures. The NHTSA MDB and the front structures of passenger cars and light trucks are all significantly stiffer than the side structure of a struck vehicle. The NHTSA MDB, while having greater frontal stiffness in a fixed rigid barrier test, behaves very much like the front-end of a striking car or light truck in a side impact crash environment.

Many commenters stated that the MDB should be softer. The commenters generally believed that the softer barrier would produce less severe results in a crash test. Based on analysis of test data. NHTSA does not agree with the commenters. First, as part of its research and development program, NHTSA examined the influence of a softer (25 psi) honeycomb barrier

face. NHTSA tested the 25 psi honeycomb along with the 45 psi honeycomb specified for the MDB in side impact tests with Volkswagen Rabbits. The agency concluded from these experimental tests that a significant reduction in barrier stiffness would not significantly change occupant injury probability.

Second, Transport Canada compared the softer and lighter EEVC barrier with the proposed NHTSA barrier in tests using the EuroSID dummy. Transport Canada tested the two barriers with 1988 models of the Chevrolet Cavalier, Pontiac Bonneville, and Hyundai Excel. For these vehicles, the EEVC barrier produced EuroSID responses ranging from 39 to 46 percent higher than those produced by the NHTSA MDB. However, the MVMA also conducted tests with a Ford LTD to compare the NHTSA MDB to the EEVC barrier. These tests demonstrated no difference in responses between the two barriers.

The Transport Canada data, with a higher occupant response with the softer and lighter EEVC barrier face, is contrary to what was predicted by the Department of Transportation's side impact sensitivity model. NHTSA notes that the EEVC barrier tests were run by Transport Canada in the uncrabbed mode. NHTSA is further investigating why the softer and lighter EEVC barrier produced higher occupant responses than the NHTSA MDB in the Transport Canada tests. NHTSA discusses various theories for this in the Final Regulatory Impact Analysis.

NHTSA has also considered comments advocating a rigid moving barrier. NHTSA acknowledges that there would be cost savings with such a barrier, since persons would not have to replace the honeycomb barrier face after each test. However, NHTSA believes that a rigid moving barrier would increase the stringency of the test procedure and result in higher occupant responses as measured by TTI(d). Further, NHTSA believes that a moving rigid barrier would not be representative of actual crash environments. First, the rigid moving barrier would not absorb any energy in a crash and the struck vehicle would, therefore, experience higher side intrusion. Second, in a crash test, the interaction between the occupant and the inner-door might be different because of the greater side intrusion with a rigid moving barrier. In addition NHTSA believes that a rigid moving barrier would be much stiffer than the MDB. As discussed above, NHTSA received comments complaining about the alleged excessive stiffness of the MDB.

NHTSA concludes that the stiffness of the proposed MDB is appropriate for the final rule. While the MDB is stiffer than the average passenger car or light truck, as measured in a fixed frontal barrier test, NHTSA believes that there are significant differences between the barrier test and the side impact crash environment. Volvo recognized this in its comments where it stated that "all these judgments are based on front characteristics measured against a flat fixed barrier. Thus they have limited validity regarding side impact against a car."

In a side impact crash, the front-end of the striking vehicle absorbs very little energy and crushes very little because of its greater relative stiffness compared to the side of the struck vehicle. The NHTSA MDB behaves similarly. The aggressiveness of the MDB was close to the aggressiveness of the Ford Taurus, a popular mid-size passenger car, in the Transport Canada side impact tests using a Chevrolet Cavalier as the struck vehicle. While the NHTSA MDB has a higher frontal stiffness than the Ford Taurus, when measured in a fixed rigid barrier test, both were equally aggressive and created the same deformation pattern in tests with the Cavalier. In addition, the NHTSA MDB produced lower occupant responses in the Cavalier (with the EuroSID dummy) in the Transport Canada tests than did the Ford Taurus. On the basis of the empirical tests discussed above and the above analysis. NHTSA concludes that the MDB face stiffness is reasonable.

B. Bumper Stiffness

NHTSA received a number of comments concerning the stiffness of the MDB bumper. The EEVC stated that requiring tests with the bumper simulation on the proposed barrier face could lead to the wrong car modifications. Ford suggested softening the bumper on the proposed NHTSA barrier face to make it more car-like. Porsche stated that the barrier is too stiff, especially the bumper.

The MDB bumper is constructed of a 245 psi crush strength aluminum honeycomb designed to simulate the stiffness of the hard points in the front structure of a striking vehicle, i.e., the frame rails and engine, planing laterally across the side of the struck vehicle. Thus, the MDB bumper is highly aggressive and does not undergo a great deal of yielding during a crash. This is similar to the front structure of an automobile or light truck in a side impact collision. NHTSA has found that the localized regions of a vehicle's front structure appear to be the dominant factor in the deformation patterns observed on the sides of struck vehicles in actual crashes. These regions are generally associated with the frame rails and the engine. As shown above, the NHTSA MDB, as a whole, behaves like a typical passenger car or light truck striking vehicle in a side impact crash. The barrier face loads the struck vehicle in much the same way that a typical passenger car or light truck would. For the above reasons, NHTSA believes that the stiffness of the MDB bumper is appropriate and that tests using the MDB bumper will properly assess side impact crash protection.

C. Dynamic vs. Static Barrier Face Properties

NHTSA received a number of comments supporting a dynamic force-deflection specification for the MDB barrier face. The proposed rule provided only static crush characteristics of the aluminum honeycomb (45 plus or minus 2.5 psi and 245 plus or minus 15 psi). Nissan commented that the dynamic performance characteristics of the barrier face need to be specified. According to Nissan, specifying the characteristics rather than a type of material would allow a manufacturer to use cost-effective materials in the barrier face. Toyota stated that a honeycomb face produced in Japan to NHTSA's specified static properties differed in dynamic characteristics. It further stated that the energy absorbing material used for a honeycomb face should be specified by dynamic characteristics. The Japanese Automobile Standards Internationalization Center (JASIC) urged that the energy absorbing performance of the barrier face material be stipulated in terms of its characteristics, rather than the type of material (i.e., they requested that NHTSA establish a dynamic certification test). Ford was concerned that the barrier face specifications do not apply to the initial and highest force levels found in crushing the barrier face (i.e., the static crush specification does not establish initial and highest force levels.

NHTSA does not believe that it is necessary to specify the dynamic crush characteristics, including the initial and the highest force levels, of the honeycomb in this rule. NHTSA already specifies the static properties of the barrier. In addition, dynamic force measurements are not as accurate as static measurements. NHTSA believes that it would be both costly and time consuming to develop dynamic certification tests for the MDB faces. Further this type of certification would have low practicality and questionable effectiveness since it would require the destruction of the MDB face being certified.

NHTSA acknowledges that a benefit of specifying dynamic crush characteristics would be to allow manufacturers to use alternative materials (e.g., a foam face) for the honeycomb if they are within the dynamic specifications. However, NHTSA has not identified any material other than the aluminum honeycomb that gives consistent performance.

NHTSA believes that it is most appropriate to specify the static crush characteristics since they can be measured more precisely than the dynamic properties. The side impact test procedure already defines a method for certification of the 45 psi aluminum honeycomb material's static properties so that the crash test results are repeatable. *See* Aluminum Honeycomb Crush Strength Certification Procedures. Essentially, three samples of aluminum honeycomb material (six inches by six inches by one inch) are cut and crush tested at a rate of 0.20 inches per minute. Measurements of load and deflection are made at three sections between 0.25 inches and 0.65 inches of the one inch sample. The range of acceptability is 42.5 to 47.5 psi. NHTSA has not developed a certification procedure for the 245 psi bumper honeycomb material because the bumper is a flexion member which develops its strength based on the material properties of the front and back aluminum plates that sandwich the honeycomb. NHTSA believes that its design specifications for the bumper and specifications of bumper crush strength are adequate to assure MDB repeatability.

Further, test data indicate that the NHTSA test procedure provides acceptable dynamic repeatability even though the dynamic characteristics of the honeycomb barrier face are not specified. NHTSA conducted load cell barrier tests on three samples of aluminum honeycomb barrier face material. The three resultant test results indicate excellent dynamic repeatability. The dynamic force deflection curves, which show the dynamic repeatability, are provided in the Final Regulatory Impact Analysis. Further, as discussed more fully in the Final Regulatory Impact Analysis, the side-impact test procedure has acceptable repeatability. The variability found in the testing comes from a number of sources (e.g., the test dummy, the test site, the test procedure, and the test vehicle). Since the dynamic variability of the aluminum honeycomb is but a small part of the overall test procedure variability and since the overall variability is acceptable, NHTSA concludes that the dynamic variability of the honeycomb is acceptable. Since the MDB requirements provide repeatable test results, NHTSA does not believe that the additional expenditures of time and money for dynamic certification tests are necessary.

VII. Barrier Face Variability

NHTSA received a number of comments concerning barrier face stiffness variability. GM stated that the variability of the aluminum honeycomb stiffness can be significant. In its comments, Ford attributed test result variability to manufacturing variations in the aluminum honeycomb material. Ford tested undeformed portions of several barrier faces that had been used in crash tests. Although the faces all were certified by the manufacturers as meeting NHTSA's proposed force-deflection specification, Ford stated that the stiffnesses varied widely and many of the barrier faces fell outside the NHTSA specification. Ford also commented that, in a test it conducted, the initial stiffness of the barrier was four times higher than stated in the proposal and that the honeycomb crush distance was very small (i.e., less than two inches). Chrysler stated that, in a test it conducted, the stiffness of the proposed barrier exceeded the 10,000 pounds per inch design target.

NHTSA tested samples of the 45 psi honeycomb material at the NHTSA Vehicle Research and Test Center (VRTC) following the specified procedure.

NHTSA found that the different samples of the material performed in a very similar way and were well within the proposed specifications. While the permitted variation is 45 psi plus or minus 2.5 psi (5.55 percent), the variation in the sample was 46.6 psi plus or minus 0.75 percent. This is well within the acceptable range of 42.5 to 47.5 psi specified by NHTSA. Further details concerning these tests and a table of test results are provided in the Final Regulatory Impact Analysis.

Discussions that NHTSA personnel had with Ford personnel indicated that Ford was not cutting the sample of material correctly. Ford's cutting procedure was causing crush damage to the thin honeycomb wall of the samples, which introduced variability. As a result of this, NHTSA has added blade and cutting specifications to the above procedure.

Ford and Chrysler's comments that their measurements of the initial stiffness of the MDB differ from NHTSA's measurements can in part be explained by the difficulty of measuring dynamic force and deflection. It is more difficult to measure crush characteristics (i.e., force and deflection) dynamically than statically. As discussed above, NHTSA has adopted a static crush test methodology, rather than a dynamic certification test, for certification of the honeycomb barrier face material. Further, as discussed in the main side impact notice, NHTSA is satisfied with the overall side impact test procedure variability and believes that the dynamic variability of the honeycomb material has a small effect on overall variability. NHTSA has also reviewed GM's assertion that honeycomb variability can be significant. NHTSA notes that GM only stated the permissible tolerances specified by NHTSA rather than presenting test data. NHTSA believes that the range of tolerance must be allowed in the specifications if the honeycomb is to be manufactured at a reasonable cost. Further, with the current tolerance specifications, the barrier produces consistent test results. In the test discussed previously, NHTSA selected three samples of aluminum honeycomb barrier face material and conducted load cell barrier tests at 14.7 miles per hour (mph), with a crabbed impact angle of 19 degrees. NHTSA recognizes that these conditions were not identical to those in the side impact test procedure. However, the three test results indicate acceptable dynamic repeatability. The dynamic force deflection curves, which show the dynamic variability, are provided in the Final Regulatory Impact Analysis. NHTSA does not believe that the permissible tolerances will cause noticeable differences in test results.

VIII. Inertial and Dynamic Properties

NHTSA received one comment concerning the inertial and dynamic properties of the MDB described in the proposal. GM stated that the center of gravity and the front-to-rear mass ratio of the barrier were not specified in the NPRM. GM stated that these inertial properties of the barrier are needed because they affect how the barrier rotates and, therefore, how the struck vehicle is crushed. NHTSA has included information concerning the center of gravity coordinates and the inertial properties of the MDB in the regulatory text. Information concerning the barrier's inertial properties may also be found in Unit II of this preamble and in the Final Regulatory Impact Analysis.

While the MDB's center of gravity coordinates and inertial properties were not specified in the NPRM, that information is listed in a document added to the public docket during the comment period in July, 1988 (Docket item 88-06-NO1-013). All information relating to inertial properties is either provided in the public docket submission or can be calculated from the data provided in the document. The weight, wheelbase, location of the center of gravity, pitch, roll, and yaw moments of inertia are specified in the document. The front-to-rear mass ratio can be calculated from the data concerning center of gravity and weight provided in the public docket submission.

It is important to note that GM did not claim that the inertial properties of the NHTSA MDB were not representative, only that they were not specified in the NPRM. However, NHTSA compared the inertial properties of the barrier (with and without camera equipment) to an aggregate sample of 50 passenger cars and 82 light trucks. The sample, while dominated by later model years, represents a cross section of vehicles manufactured and sold during the 1980s. As shown in the Final Regulatory Impact Analysis, the inertial properties of the NHTSA MDB are all reasonably close to the average inertial properties of the combined sample of 132 passenger cars and light trucks.

IX. Alternative Side Impact Barriers

The proposed rule and the Preliminary Regulatory Impact Analysis discussed barriers developed by the Committee of Common Market Automobile Constructors (CCMC) and the European Experimental Vehicles Committee (EEVC). NHTSA stated in the proposed rule that it was concerned about using either of those barriers because they did not appear to be representative of the striking vehicles in side impact crashes in the United States. The NHTSA MDB is about 50 percent heavier and has a larger barrier face than the European ones. The European barriers appear to be more representative of the lighter and smaller European and Japanese passenger cars. In addition, the NHTSA barrier is made of different material and has a stiffer face than those proposed in Europe. The NHTSA test procedure, using the NHTSA MDB, delivers about 113,000 foot-pounds of energy, compared with the European procedure, which delivers

only 62,980 foot-pounds of energy. NHTSA estimates that only about four to five percent of this crash energy is absorbed by the NHTSA MDB, whereas the EEVC barrier face appears to disintegrate, making estimates of crash energy absorption impossible. The NHTSA, CCMC, and EEVC barriers all must be replaced after each test. A more detailed comparison of the NHTSA MDB with the CCMC and EEVC barriers is contained in the Final Regulatory Impact Analysis.

NHTSA received comments advocating the use of one of the European barriers. The Commission of the European Communities favored the barrier face and barrier front stiffness of the EEVC barrier. Volvo stated that the CCMC barrier, with minor modifications, would have the best characteristics to simulate a car-to-car impact. MVMA stated that the EEVC barrier face should be adopted because it is more representative of the average front-end stiffness characteristics and size of world passenger cars. Austin Rover also stated that the EEVC barrier is more representative of actual world cars. USTRC stated that the different results obtained for the CCMC barrier compared to the NHTSA barrier show that the NHTSA MDB is not representative. The EEVC was concerned that the NHTSA barrier face, made of aluminum, will cost four times as much as the European barrier face, which is made of polyurethane. These comments were generally addressed in prior units of this preamble. but will be addressed further below.

NHTSA has reviewed the results of side impacts tasts using both the EEVC barrier and the NHTSA barrier. The 2,095 pound EEVC barrier was tested by Transport Canada using the EEVC urethane foam barrier face and the European test procedure of a 90-degree impact angle and the EuroSID dummy. The NHTSA barrier was also tested using the EuroSID dummy. When both barriers were tested with a Chevrolet Cavalier as the struck vehicle, TTI(d) values were 46 percent higher for the EEVC barrier than for the NHTSA barrier. When both barriers were tested with a Hyundai Excel and a Pontiac Bonneville as struck vehicles, and the EuroSID dummy, the Transport Canada tests found TTI(d) values to be 39 percent higher in each case for the EEVC barrier compared to the NHTSA MDB.

These results are not consistent with more recent tests by MVMA. In these tests, MVMA compares the EEVC barrier and procedure to the NHTSA barrier and procedure using the EuroSID dummy and a Ford LTD as the struck vehicle. NHTSA discusses these tests in more detail in the Final Regulatory Impact Analysis.

The results of the Transport Canada tests, where the higher occupant response (as measured with TTI(d) and pelvic g's) was with the softer and lighter EEVC barrier face, are contrary to what was predicted by the Department of Transportation's side impact sensitivity model. NHTSA is further investigating why the softer and lighter EEVC barrier produced higher occupant responses than the NHTSA MDB in the Transport Canada tests. NHTSA discusses various theories for this in the Final Regulatory Impact Analysis.

NHTSA also studied the variability of the European side impact test procedure, with the EEVC barrier face and the EuroSID dummy, using data generated by MVMA. NHTSA compared the results to the results of the tests MVMA conducted using NHTSA's test procedure (including the SID dummy). The variability comparisons between the test procedures are shown in the table below.

Table II

Test Procedure Variability Range Comparison

	U.S./NHTSA (CV)[1]	European/EEV (CV)[2]
1. Baseline, No Padding	±2.34 to 7.55%	±0.8 to 7.1%
2. Baseline, w/Padding	±2.62 to 7.07%	±3.9 to 10.8%
3. Modif. Struct., No Padding	±0.58 to 9.39%	±1.3 to 11.2%
4. Modif. Struct., w/Padding	±0.81 to 5.00%	±0.1 to 7.4%

[1]/MVMA n=16

[2]/MVMA n=8

Based on these results, NHTSA concludes that the variability of the European side impact test procedure based on a 90 degree impact angle EuroSID, and the EEVC barrier is slightly greater than NHTSA's crabbed side impact test procedure using the NHTSA MDB and the SID. Some of the difference in variability of the procedures may be attributed to the differences between the EuroSID and the SID dummies as well as differences in variability of the deformable barrier faces.

Concerning the comment about the cost of the NHTSA barrier face. NHTSA acknowledges that assembled barrier faces are currently available only from Hexcel Corporation at a cost of about $1,700 each, if purchased in quantity. NHTSA also acknowledges that the barrier faces must be replaced after each test. However, NHTSA has not identified any other barrier face material that gives consistent performance in crash tests.

As discussed in earlier units of this preamble, NHTSA believes that the NHTSA MDB is sufficiently representative (in terms of weight, dimensions, inertia, and stiffness) of passenger cars and light trucks that are likely to be the striking vehicle in side impact collisions in the United States. NHTSA also believes that it is appropriate that the MDB be representative of such vehicles rather than representative of vehicles used in other nations. NHTSA further believes that the European barriers, because of their light weight, are not representative of vehicles in the United States. In addition, NHTSA would be reluctant to adopt the EEVC barrier as a compliance testing device because of its inconsistent behavior in the Transport Canada tests.

X. Conclusions Concerning the NHTSA MDB

Based on the above discussion, NHTSA concludes that the NHTSA MDB is representative of the average passenger car and LTV population in the United States. NHTSA also concludes that it is appropriate for the NHTSA MDB to be representative of both the passenger car and LTV population in the United States. As discussed above and in the Final Regulatory Impact Analysis, LTV sales have increased dramatically in the last ten years and LTV registrations are increasing as a percentage of total light vehicle registrations. LTV's, as the striking vehicle, accounted for over 35 percent of side impact collision fatalities and for over 30 percent of the side impact collision injuries classified as AIS 3 or greater in 1988. Further, NHTSA has shown above that the MDB weight and stiffness do not make the test procedure more stringent than appropriate to simulate the impact of a striking passenger car or LTV. In addition, NHTSA has shown that the dimensions of the MDB correspond to average specifications for the combined passenger car and LTV fleet. Finally, NHTSA concludes that the NHTSA barrier is superior to the CCMC and EEVC barriers for purposes of this rule. The NHTSA MDB is more representative of the striking vehicles in side impact collisions in the United States.

PART 587

In consideration of the foregoing, Chapter V, Title 49, Transportation, the Code of Federal Regulations is amended by adding a new Part 587 to read as follows:

PART 587—
Side Impact Moving Deformable Barrier

Sec.
587.1 Scope.
587.2 Purpose
587.3 Application
587.4 Definitions
587.5 Incorporated materials
587.6 General description

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§ 587.1 Scope.

This part describes the moving deformable barrier that is to be used for testing compliance of motor vehicles with motor vehicle safety standards.

§ 587.2 Purpose.

The design and performance criteria specified in this part are intended to describe measuring tools with sufficient precision to give repetitive and correlative results under similar test conditions and to reflect adequately the protective performance of a motor vehicle or item of motor vehicle equipment with respect to human occupants.

§587.3 Applicability.

This part does not in itself impose duties or liabilities on any person. It is a description of tools that measure the performance of occupant protections systems required by the safety standards that incorporate it. It is designed to be referenced by, and become a part of, the test procedures specified in motor vehicle safety standards, such as Standard No. 214, *Side Impact Protection.*

§ 587.4 Definitions.

All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

§ 587.5 Incorporated materials.

(a) The drawings and specifications referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. These materials are thereby made part of this regulation. The Director of the Federal Register has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the Federal Register and specified in the regulation are incorporated. A notice of any change will be published in the *Federal Register.* As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the *Code of Federal Regulations.*

(b) The drawings and specifications incorporated in this part by reference are available for examination in the general reference section of Docket 79-04, Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, SW, Washington, D.C. 20590. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1111 14th Street, NW, Washington, D.C. 20005, telephone (202) 628-6667 or (202) 408-8789. The drawings and specifications are also on file in the reference library of the Office of the Federal Register, National Archives and Records Administration, Washington. D.C.

§ 587.6 General description.

(a) The moving deformable barrier consists of component parts and component assemblies which are described in drawings and specifications that are set forth in this Part 587.6 of this Chapter.

(b) The moving deformable barrier specifications are provided in the drawings shown in DSL-1278 through DSL-1287, except DSL-1282.

(1) The specifications for the final assembly of the moving deformable barrier are provided in the drawings shown in DSL-1278.

(2) The specifications for the frame assembly of the moving deformable barrier are provided in the drawings shown in DSL-1281.

(3) The specifications for the face of the moving deformable barrier are provided in the drawings shown in DSL-1285 and DSL-1286.

(4) The specifications for the ballast installation and details concerning the ballast plate are provided in drawings shown in DSL-1279 and DSL-1280.

(5) The specifications for the hub assembly and details concerning the brake are provided in drawings shown in DSL-1283.

(6) The specifications for the rear guide assembly are provided in drawings shown in DSL-1284.

(7) The specifications for the research axle assembly are provided in drawings shown in DSL-1287.

(c) In configuration 2 (with two cameras and camera mounts, a light trap vane, and ballast reduced), the moving deformable barrier, including the impact surface, supporting structure, and carriage, weighs 3,015 pounds, has a track width of 63 inches, and a wheelbase of 102 inches.

(d) In configuration 2, the moving deformable barrier has the following center of gravity:

X = 44.2 inches rear of front axle
Y = 0.3 inches left of longitudinal center line
Z = 19.7 inches from ground.

(e) The moving deformable barrier has the following moment of inertia:

Pitch = 1669 $ft\text{-}lb\text{-}sec^2$
Roll = 375 $ft\text{-}lb\text{-}sec^2$
Yaw = 1897 $ft\text{-}lb\text{-}sec^2$

Issued on October 24, 1990

Jerry Ralph Curry
Administrator

55 F.R. 45770
October 30, 1990

PART 587—SIDE IMPACT MOVING DEFORMABLE BARRIER

§ 587.1 Scope. This part describes the moving deformable barrier that is to be used for testing compliance of motor vehicles with motor vehicle safety standards.

§ 587.2 Purpose. The design and performance criteria specified in this part are intended to describe measuring tools with sufficient precision to give repetitive and correlative results under similar test conditions and to reflect adequately the protective performance of a motor vehicle or item of motor vehicle equipment with respect to human occupants.

§ 587.3 Applicability. This part does not in itself impose duties or liabilities on any person. It is a description of tools that measure the performance of occupant protection systems required by the safety standards that incorporate it. It is designed to be referenced by, and become a part of, the test procedures specified in motor vehicle safety standards, such as Standard No. 214, *Side Impact Protection.*

§ 587.4 Definitions. (a) All terms defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used in their statutory meaning.

§ 587.5 Incorporated materials.

(a) The drawings and specifications referred to in this regulation that are not set forth in full are hereby incorporated in this part by reference. These materials are thereby made part of this regulation. The Director of the Federal Register has approved the materials incorporated by reference. For materials subject to change, only the specific version approved by the Director of the Federal Register and specified in the regulation are incorporated. A notice of any change will be published in the *Federal Register*. As a convenience to the reader, the materials incorporated by reference are listed in the Finding Aid Table found at the end of this volume of the *Code of Federal Regulations.*

(b) The drawings and specifications incorporated in this part by reference are available for examination in the general reference section of Docket 79–04, Docket Section, National Highway Traffic Safety Administration, Room 5109, 400 Seventh Street, S.W., Washington, D.C. 20590. Copies may be obtained from Rowley-Scher Reprographics, Inc., 1111 14th Street, N.W., Washington, D.C. 20005, telephone (202) 628-6667 or (202) 408-8789. The drawings and specification are also on file in the reference library of the Office of the Federal Register, National Archives and Records Administration, Washington, D.C.

§ 587.6 General description.

(a) The moving deformable barrier consists of component parts and component assemblies which are described in drawings and specifications that are set forth in this Part 587.6 of this Chapter.

(b) The moving deformable barrier specifications are provided in the drawings shown in DSL-1278 through DSL-1287, except DSL-1282.

(1) The specifications for the final assembly of the moving deformable barrier are provided in the drawings shown in DSL-1278.

(2) The specifications for the frame assemble of the moving deformable barrier are provided in the drawings shown in DSL-1281,

(3) The specifications for the face of the moving deformable barrier are provided in the drawings shown in DSL-1285 and DSL 1286.

(4) The specifications for the ballast installation and details concerning the ballast plate are provided in drawings shown in DSL-1279 and DSL-1280.

(5) The specifications for the hub assembly and details concerning the brake are provided in drawings shown in DSL-1283.

(6) The specifications for the rear guide assembly are provided in drawings shown in DSL-1284.

(7) The specifications for the research axle assembly are provided in drawings shown in DSL-1287.

(c) In configuration 2 (with two cameras and camera mounts, a light trap vane, and ballast reduced), the moving deformable barrier, including the impact surface, supporting structure, and carriage, weighs 3,015 pounds, has a track width of 63 inches, and a wheelbase of 102 inches.

(d) In configuration 2, the moving deformable barrier has the following center of gravity:

X	= 44.2 inches rear of front axle
Y	= 0.3 inches left of longitudinal center line
Z	= 19.7 inches from ground.

(e) The moving deformable barrier has the following moment of inertia:

Pitch	= 1669 ft.-lb.-sec.^{2}
Roll	= 375 ft.-lb.-sec.^{2}
Yaw	= 1897 ft.-lb.-sec.^{2}

55 F.R. 45770
October 30, 1990

PREAMBLE TO AN AMENDMENT TO PART 591
(Docket No. 89-5; Notice 4)
Importation of Motor Vehicles and Equipment
RIN 2127-AD00

ACTION: Action on petitions for reconsideration and rulemaking; final rule.

SUMMARY: The purpose of this notice is to act upon petitions for reconsideration of the final rule of the National Highway Traffic Safety Administration governing importation of motor vehicles and equipment subject to the Federal motor vehicle safety standards. The petitions were filed by Volkswagen of America, and Superior Auto Sales. The notice grants Volkswagen's petition for deletion of the requirement that the Administrator provide prior approval for vehicles imported for purposes of research, etc., and for substitution of the proposed (and existing) requirement that a statement of purpose accompany the importation declaration. This issue was also raised by Mazda of North America in a petition for rulemaking, which is also granted. The notice amends a reference to certification in section 591.5(b), thereby curing an inconsistency for whose correction Volkswagen had petitioned.

The notice also clarifies ambiguities and makes technical corrections. It clarifies that the agency has treated chassis-cabs for many years as vehicles that must bear a form of certification upon entry, as do completed motor vehicles, and that they are not vehicles requiring further manufacturing operations under the revised regulatory scheme. Pursuant to a letter from Ford pointing out that importers of vehicles requiring further manufacturing operations cannot be expected to declare that the vehicle will conform upon final manufacture when finishing operations are done by other persons, the declaration, section 591.5(e), is amended to remove reference to conformity upon completion of manufacture.

The notice also addresses Mazda's concern for confidentiality of vehicles imported for research, and for NHTSA's consideration of a test fleet permit system.

With respect to Superior's petition for reconsideration of treatment of Canadian-manufactured motor vehicles, the notice denies it for the reasons stated below.

Finally, pursuant to informal consultations with the State Department, the notice amends in minor respects section 591.5(h), relating to importation by foreign military personnel, members of the Secretariat of a public international organization, and other personnel of foreign governments. This amendment is necessary to make this agency's regulations conform with existing practices of that Department's Office of Foreign Missions.

EFFECTIVE DATE: February 5, 1990.

SUPPLEMENTARY INFORMATION: On October 31, 1988, the President signed P.L. 100-562, the Imported Vehicle Safety Compliance Act of 1988 ("the 1988 Act"). A notice of proposed rulemaking to establish 49 CFR Part 591 was published on April 25, 1989 (54 FR 17772), and a final rule on September 29, 1989 (54 FR 40069). As the notices stated, the 1988 Act amends those provisions of the National Traffic and Motor Vehicle Safety Act of 1966 ("the Vehicle Safety Act") that relate to the importation of motor vehicles subject to the Federal motor vehicle safety standards (section 108(b), 15 U.S.C. 1397(b)).

Two petitions for reconsideration of the final rule were received, one from Volkswagen of America (VW), on behalf of itself, its parent Volkswagen, AG, and Audi AG, and the other from Auto Enterprises, Inc./Superior Auto Sales (Superior). Even though the Superior petition was not officially received until after the 30th day following publication of the final rule, it was sent by UPS on the 26th day, and apparently arrived at NHTSA on the 30th day but for reasons unknown was returned to the petitioner. The agency, therefore, has chosen to consider it timely filed. Mazda Research & Development of North America, Inc., also petitioned for reconsideration, but its petition was received on the 31st day following publication of the rule, and in accordance with agency regulations (49 CFR 553.35) has been treated as a petition for rulemaking. Informal comments were received from the Office of Foreign Missions of the State Department, calling the agency's attention to its registration procedures for vehicles imported by foreign diplomats, and its lack of registration authority for vehicles imported by foreign military personnel. To the extent that these differ from Part 591, corrective conforming amend-

ments have been made, as more fully discussed below.

A. *Importation by Foreigners Excepted by Statute*

In section 591.5(h), the agency sought to follow the statute, and its understanding of the Department of State's practices, in specifying provisions regarding the importation of nonconforming motor vehicles by certain foreign citizens. Section 591.5(h) provides that such vehicles may be imported by a member of one of three categories specified by statute, pursuant to the declaration that the importer will not sell the vehicle to any person in the United States (other than a buyer in one of the three excepted categories), and that the Office of Foreign Missions (OFM) of the State Department will be provided with documentary proof that the vehicle is being, or has been exported, before the importer departs the United States at the conclusion of a tour of duty.

After reviewing section 591.5(h), OFM has informed this agency that that section differs in several respects from established practices of the Department of State. On the basis of these further comments, this agency is restructuring section 591.5(h) to conform to OFM's regulations and practices. These comments have reassured NHTSA that nonconforming vehicles subject to OFM's procedures are not likely to be sold to American citizens by their importers.

1. *Personnel of a Foreign Government or International Organization*

Under the regulations of the Department of State, personnel of a foreign government on assignment in the United States, or members of the Secretariat of a public international organization within the meaning of the International Organizations Immunities Act, who have been authorized by the Department of State to enter their vehicles duty free, must register with OFM all vehicles they own or operate in the United States, including nonconforming vehicles they have imported. Under the registration process, OFM takes and keeps the vehicle title. Thus, if the vehicle owner wishes to dispose of the vehicle, (s)he must petition OFM for a title. The petition must indicate the reason the title is requested, such as sale, export, or re-registration in the importer's State of residence at the end of a tour of duty.

This is a category of importer currently covered by the joint NHTSA-Customs Service rule, 19 CFR 12.80(b)(i)(v), and which will be covered by the new NHTSA rule, section 591.5(h). Owners of nonconforming vehicles imported pursuant to these provisions may not sell the vehicle in the United States except to another person eligible to import the vehicle under these paragraphs. In these cases, OFM requires a corresponding petition from the new owner of the vehicle, and automatically registers the nonconforming vehicle in the name of the new owner. Since no title is needed to transfer ownership, none is issued.

OFM will not issue a title for a nonconforming vehicle that an owner who is remaining in the U.S. at the end of the tour of duty wishes to register in the State of residence.

OFM issues (and will continue to issue) titles to the owners importing vehicles under these provisions, but only for purposes of export. The character of these titles and the nonconforming nature of the vehicle are clearly noted on the front of the export title. Because of this, it is unlikely that a State would ever register a vehicle based upon an OFM export title. The export title will be a surrogate for the documentary proof of export that paragraph (h), as adopted, will require. Therefore, to accord with OFM's practices, instead of specifying that the importer will provide OFM with documentary proof that the vehicle has been or will be exported, NHTSA is amending paragraph (h) to specify that an importer will obtain from OFM, before departure at the conclusion of a tour of duty, an ownership title to the vehicle good for export only.

2. *Members of Foreign Armed Forces on Assignment in the U.S.*

Section 591.5(h) as adopted also requires members of the armed forces of a foreign country on assignment in the U.S. to provide OFM with documentary proof of export. However, OFM advises that members of this category are generally not required to register their vehicles with OFM, and that therefore they cannot be included with the two other categories for which OFM is able to provide export titles. This means it is possible for a sale of the vehicle and transfer of a foreign title to a U.S. buyer to occur, as there is no Federal intermediary to regulate the transaction. In this event, the vehicle would have to meet the registration requirements of the individual States, some of which may specify compliance with the Federal motor vehicle safety standards. In restructuring paragraph (h) to reflect the comments of OFM, the agency has removed the requirement for provision of documentary proof of export, and replaced it with an affirmative declaration to export the vehicle at the conclusion of the tour of duty. The existing prohibition against sale of the vehicle to any person in the United States, except to another member of the armed forces of a foreign country on assignment in the United States, is retained.

B. *Importation for Purposes of Research, etc.*

1. *Submittal of Substantiating Information Prior to Entry*

Under Section 591.5(j), a motor vehicle not originally manufactured to conform to the Federal motor

vehicle safety standards may be imported pursuant to the declaration that it is being imported for the purposes of research, investigation, studies, demonstrations or training, or competitive racing events, provided that the importer has received written permission from the NHTSA. Under the second sentence of section 591.6(g) (reparagraphed by this notice; see below), each such declaration must be accompanied by a letter from the Administrator authorizing such importation. As the regulation further states, an importer shall submit in advance of such importation a written request to the Administrator, containing the information the regulation requires.

VW has petitioned for deletion of this requirement, arguing that the proposed rule published in April 1989 did not include a requirement that a letter of authorization be submitted, and would have required only a statement from the manufacturer to Customs of the nature currently provided. Thus, VW believes that it had no opportunity to comment upon this requirement.

NHTSA has considered VW's comment, as well as a similar concern raised by Mazda. Although the agency believes that enforcement of the Act will be enhanced by this provision, and that the requirement it adopted was within the scope of the notice, it nevertheless believes it desirable to have further comment upon the provision. Accordingly, sections 591.5(j) and 591. 6(f) are being amended to continue the existing requirements beyond January 31, 1990. The agency, however, is considering the issuance of a notice of proposed rulemaking formally proposing the requirements that are being deleted by this notice.

However, section 591.5(j) as amended differs in one minor respect from the text proposed. Paragraph (j) lists five categories of permissible purposes of importation contained by the declaration. The proposed text ended with the secondary declaration applicable to all five categories that the vehicle would not be licensed for use on the public roads. The agency does, in fact, allow licensing for use on the public roads when a vehicle has been imported for purposes of test or experiment (19 CFR 12.80(b)(2)). Although these terms are not used by the 1988 Act, which added section 103(j) to the National Traffic and Motor Vehicle Safety Act, the agency has concluded that "research, investigations, studies, and demonstrations or training," terms that appear in section 103(j), are so substantially similar to "test or experiment" that on-road licensing should be allowed. Consequently, section 591.5(j) is being amended to apply the prohibition that was proposed to apply to all categories only to vehicles imported for "competitive racing events." This accords with the informal definition in 19 CFR 12.80(b)(1)(vii) that "a vehicle the configuration of which at the time of entry is such that it cannot be licensed for use on the public roads is considered to be imported for the purpose of competition."

C. *Importations Requiring Further Manufacturing*

Section 108(e) of the Act provides that there will be no violation of the Act by the importation of a vehicle or equipment item if the vehicle or equipment item requires further manufacturing operations to perform its intended function, as determined by NHTSA, and is accompanied at the time of entry by the written statement of its manufacturer indicating the applicable Federal standard with which the vehicle or equipment item fails to comply. In implementation of this requirement, the agency adopted section 591.5(e), containing the basic declaration that the vehicle requires further manufacturing operations to perform its intended function, and section 591.6(b) requiring the statement to accompany the declaration. Section 591.5(e) concludes with the phrase that upon completion of further manufacturing operations, the vehicle "will comply with all applicable Federal motor vehicle safety standards." This language assumes that an importer of a vehicle requiring further manufacturing operations is the person who will complete the vehicle.

In a letter to the agency, Ford noted that it is impossible for those importers of incomplete vehicles who do not complete the vehicles to declare that the vehicle when completed will comply with all applicable standards. Further, the obligations to complete the vehicle in a conforming manner and to certify conformance already exist independently as requirements of section 108(a)(1)(A) and section 108(a)(1)(C). A civil penalty may be imposed if they are not met. Therefore, it is not legally necessary as a condition of admission to require those importers who will perform further manufacturing operations to the point of completion to declare that they will do so in a conforming manner. NHTSA therefore is revising section 591.5(e) to remove the language of conformance completion.

The agency noted in the preamble to the final rule (p. 40074) that "a vehicle requiring further manufacturing operations to perform its intended function is an 'incomplete vehicle' as defined by part 568." However, there is a subcategory of "incomplete vehicle" which existing agency regulations (Part 567) have required to bear a form of certification of partial compliance. This type of vehicle is a "chassis-cab," defined under the certification regulation as "an incomplete vehicle with a completed occupant compartment, that requires only the addition of cargo-carrying, work-performing, or load-bearing components to perform its intended functions" (section 567.3). The manufacturer of the chassis-cab is required to affix a label stating conformity with the standards with which the chassis-cab complies (*e. g.*,

controls and displays, wiping and washing systems, brake hoses) and certain statements with respect to the remaining standards (section 567.5(a)). Certification of chassis-cabs has been required for over 11 years, and, in enforcing the existing importation provisions, the agency has required entry of uncertified chassis-cabs as nonconforming vehicles. They have been imported under bond, and required to demonstrate conformance with chassis-cab requirements before the bond has been released. The agency did not intend to alter the manner in which it has treated chassis-cabs for many years, as reflected in its statement in the preamble to the final rule (p. 40075) that "if the incomplete vehicle is a chassis-cab and is not certified as required, its importer must be a registered importer who undertakes to bring it into conformance with applicable standards". That is to say, a chassis-cab is a type of motor vehicle to which section 108(c) applies, rather than section 108(e). The agency wishes to clarify this point.

On a related matter, the agency notes that it is considering making in the near future a determination that chassis-cabs that are substantially similar to chassis-cabs certified for sale in the United States are capable of being readily modified to conform to chassis-cab requirements.

2. *Whether Each Vehicle Must Have a Separate Statement*

In its petition, Mazda apprised the agency of its frequent importation of multiple units of motor vehicles, and asked whether Part 591 will require a separate request for each. It advised that the California Air Resources Board (CARB) had determined that the issuance of individual permits was impractical, and, consequently implemented a fleet permit system. Under this system, the manufacturer is required to maintain records on these vehicles and to open these records for inspection by CARB on its request. Mazda asked that NHTSA consider adopting a fleet permit program similar to CARB's.

NHTSA has considered this petition. The agency does not wish to create any undue burden upon importers of vehicles under this section. Therefore, when more than one vehicle is imported, at the same time, for identical or substantially similar purposes, NHTSA is willing to accept a single HS–7 Form and pre-importation approval letter with reference to the vehicles, provided that the VIN or other identifier of each is furnished, and to issue a single letter in reply. In circumstances other than these, the agency believes that separate statements must be submitted, and approvals given. To the extent discussed herein, therefore, Mazda's petition is granted.

3. *Confidentiality of Information*

Mazda expressed concern about the confidentiality of the applications that would be submitted under section 591.6(f). According to Mazda, the applications, if made available to the public, and most notably to other manufacturers, could provide insight into future product plans and emerging technology.

NHTSA wishes to reassure Mazda and other manufacturers that the information to be submitted does not differ from that Mazda has provided in the past to substantiate its importations for research, testing, and the like. NHTSA is not aware that this has heretofore resulted in requests for confidentiality, or a compromise of a manufacturer's product plans. If a manufacturer believes that its statements will contain confidential material, it may, of course, request appropriate treatment.

D. *Original Equipment Manufacturer*

VW reiterated its request in comments on the proposal (Notice 1) that the definition of "original manufacturer" include reference to motor vehicle equipment. Although the agency addressed this issue in the preamble to the final rule (Notice 2) by saying that it was not adopted because the 1988 amendments did not affect motor vehicle equipment, VW comments that section 591.5(b) includes a reference to motor vehicle equipment "which paragraph utilizes the term 'original manufacturer'". Thus, it believes that an inconsistency exists, and that the definition in section 591.4 should be amended to include equipment.

The agency adopted the definition of "original manufacturer" for the specific purpose of excluding as manufacturers those who conform vehicles after their original production and before their importation into the United States. As a general rule, an equipment item such as a tire must be manufactured to comply, and cannot be brought into compliance after its manufacture. Thus, unlike a motor vehicle, an equipment item will generally have only one entity involved in the manufacturing or assembling process. To the extent that there is an inconsistency, NHTSA has removed it by amending section 591.5(b) to add the words "or by the manufacturer" with reference to certification of equipment items or their containers. To that extent, it grants VWs petition for reconsideration.

E. *Treatment of Canadian-Manufactured Motor Vehicles*

Superior purchases new vehicles from franchised dealers in Canada for importation into the United States, where most of them are sold to dealers holding the same franchise. Typically, the Canadian vehicles are models with U.S. counterparts which U.S. dealers have been unable to obtain in sufficient quantity from the U.S. manufacturer because of high demand. Superior assists the U.S. dealers in meeting demand for a specific vehicle by supplying it with

the Canadian counterpart. Many of the models are certified as conforming to the Federal motor vehicle safety standards. However, vehicles manufactured by General Motors (GM) and BMW are certified only as complying with the Canadian Motor Vehicle Safety Standards (CMVSS). Superior concedes that the CMVSS are not in all respects identical to the U.S. ones, but represents that the GM and BMW cars it imports do comply in all essential respects with the U.S. standards, and that they require only one modification, the substitution of a speedometer/odometer that measures miles rather than kilometers. The vehicles have been imported under bond, and proof of conformance submitted to NHTSA. With respect to vehicles manufactured by GM of Canada, the documentation submitted to verify conformance includes a copy of a "Service Parts Identification Label" which contained the code "V73". According to Superior, this indicates that the vehicle is manufactured in accordance with U.S. safety standards. Thus, heretofore, it has not been required to submit "lengthy documentation of modification details. . . ."

Petitioner submits that "there is nothing in the record upon which the Final Rule was adopted which indicates that DOT considered the impact of the rule on Canadian-U.S. trade in vehicles, which, but for the absence of a manufacturer's certification label, otherwise complied in all respects with DOT standards." Accordingly, it concludes that the rule is arbitrary, capricious, and an abuse of discretion. Further, the petitioner contends that "the scope of the Final Rule is overly broad since in not considering the subject of non-labeled FMVSS complying Canadian market vehicles, DOT has exceeded the statutory powers of the Act." It also terms this "in direct contravention of the expressed foreign policy of the United States, to wit, the U.S.-Canada Free Trade Agreement, which has as its objective, the reduction of non-tariff barriers to trade." Petitioner cites Canada's treatment of U.S.-manufactured used vehicles as consistent with the Agreement, allowing them entry without conformance even though speedometers and odometers are not expressed in kilometers, and bumpers are designed to a less stringent standard. Superior also argues that NHTSA violated Section 605 of the Agreement by failing to provide any agency of the Canadian government with a copy of the proposal published in April 1989.

Noting that the final rule has substituted "entered value of the vehicle" as a determinant of the amount of the bond given for conformance for the statutory term "dutiable value of the vehicle," Superior argues that this "arbitrary" substitution serves to create additional non-tariff barriers to trade. Because the Agreement provides for duty-free treatment of vehicles, the duty is zero; therefore Superior argues that the "dutiable value" is zero, and hence, the vehicles are exempt from the bonding requirement of the Act.

Petitioner also sought review of "the 30-day hold period required by Section 592.8", saying that it was "unnecessary and unreasonable when applied to the import of Canadian market vehicles" that require modification only of the speedometer.

Finally, petitioner believes that the final rules impose "expensive preapproval petition . . . fees" that will create a situation in which it is not economically practicable to modify the vehicles, given the small profit margin on these cars.

NHTSA understands Superior's concerns, and the agency has sought to implement the Act and regulations in a practical manner so as not to create an undue burden upon Superior and other importers of vehicles manufactured in Canada, and NHTSA will continue to do so. But the agency must work within the framework required by the 1988 Act.

The Act imposes two additional requirements upon the way Superior has done business in the past. First, in order to continue its operations, Superior must become a registered importer. The Act requires that a fee be paid to cover the costs of administering the registration program. The fee to apply to become a registered importer is $255. This, or a similar fee, will be a cost that recurs annually if the importer chooses to renew its registration.

Second, a vehicle without the certification label of its original manufacturer, such as the GM vehicles and BMWs imported by Superior, is admissible only following a determination by NHTSA that it is capable of being modified to conform to Federal standards. The Act requires that a fee be paid to cover the costs of making such a determination, whether that determination is made on the Administrator's own initiative, or upon petition by a manufacturer or a registered importer.

NHTSA is exploring the possibility of making a determination on its own initiative before January 31, 1990, that would cover all passenger cars manufactured in Canada that have counterparts that are certified and sold in the United States. Because of the similarity of Canadian and U.S. standards, such a determination need not be time-consuming, and would be a single determination covering a wide range of makes and model years. The fee for a single determination on the Administrator's initiative is payable by the first person who imports a vehicle covered by the determination. Should Superior apply for and receive registered importer status, and should it be the first importer to take advantage of the Administrator's determination, the total direct costs imposed by the Act upon Superior that are in addition to those presently incurred will be the registration fee plus the vehicle petition fee (plus

$4.35 per vehicle to reimburse Customs for its bond processing costs). This is a cost of business that should not exceed $2,500 at the most, far less than the cost of a single motor vehicle, and is easily passed on to Superior's purchasers. In fact, Superior may achieve a cost reduction in the bond itself, 150 percent of the entered value of the vehicle, if the bonds presently required for its Canadian imports have exceeded this amount.

The agency rejects the contention that the 30-day hold period will add to Superior's costs. Under the present regulation, an importer is under an obligation of indefinite length not to sell the vehicle or offer it for sale until the bond has been released; under the new regulation, the vehicle may be released from custody at the end of 30 days following submission to NHTSA of certification information, if NHTSA has not released the bond or informed the importer of the need for an inspection. In actuality, where conformance with only one standard is required, NHTSA will be able to act well before the end of the 30-day period.

NHTSA wishes to provide these reassurances of a practical nature to Superior, as it has found no legal merit in any of its arguments. The 1988 Act establishes a framework for the importation of vehicles that are not originally manufactured to conform with Federal motor vehicle safety standards, and certified by their original manufacturers as conforming to those standards. The Act establishes terms and conditions under which these vehicles may be imported, and did not establish special terms and conditions for Canadian-manufactured vehicles. Instead, it provided the Administrator with authority to admit vehicles not originally manufactured for sale in the U.S. upon a finding that they are substantially similar to vehicles manufactured for sale in the U.S., and are capable of being readily conformed to comply with the U.S. standards. Surely, this provision of the Act addresses the fact situation raised by the petitioner. NHTSA was well within its authority to adopt Parts 591–594 in the manner that it did, and did not do so in a manner that was arbitrary and capricious.

Nor can NHTSA accept Superior's characterizations of the rules as contrary to the letter or spirit of the Free Trade Agreement, or that NHTSA failed to consult with Transport Canada in their adoption. The relevant portion of the Agreement, Chapter Ten, is directed to waivers of customs duties, and the phasing out of restrictions by Canada on the importation of used cars. Section 605, referenced by Superior, is, in actuality, section 607. It obligates each country to provide the other with copies of proposed standards-related measures and product approval procedures. Although NHTSA interprets this as relating more to rulemakings affecting the Federal motor vehicle safety standards, it did provide Transport Canada and the Canadian Embassy in Washington with informal briefings on the regulations during the time the final rules were being developed, and on their potential effect on the Canadian vehicle modifiers who had commented upon the proposals. In addition, NHTSA, formally provided a copy of the proposed rule to Transport Canada during the comment period, and responded to its comments in the final rule.

Finally, there is petitioner's argument that because Canadian vehicles may enter duty-free, a bond based upon the statutory term "dutiable value" may not be imposed where the duty is zero. Requiring a bond is not inconsistent with the goal of the Free Trade Agreement that Canadian vehicles be entered duty-free. Those vehicles would still enter duty-free. However, they would do so in a way that is consistent with the goals of the 1988 amendments to the Act. The importer's obligation under the Act is to furnish "an appropriate bond" to secure conformance of a nonconforming vehicle. To adopt petitioner's argument and admit the vehicle without a bond would be to defeat the purpose of the 1988 amendments.

As for use of the term "entered value" instead of the statutory term "dutiable value, as determined by the Secretary of the Treasury", the agency explained in the final rule (p. 40073) that the Secretary of the Treasury now uses the term "entered value" in recognition that vehicles entering from certain areas are duty-free, but regards the two phrases as identical in effect. "Dutiable value" and "entered value" both mean the economic value of the vehicle as determined by Customs. Since the statute uses the term "dutiable value," the agency is substituting that term for the term "entered value" in section 591.5(f)(1), but is also amending section 591.4 by adding a provision defining "dutiable value" as meaning "entered value, as determined by the Secretary of the Treasury." Otherwise, Superior's petition is denied in every respect for the reasons discussed above.

F. *Miscellaneous*

NHTSA's review of this matter brought to its attention that when the final rule was published, it inadvertently failed to place provisions regarding importation information in a separate paragraph in section 591.6, and instead included them in 591.6(f), which relates to documents accompanying declarations by diplomats and foreign military personnel. A corrective amendment is adopted designating these provisions in section 591.6 as paragraph (g). The agency also noted that the written permission required under section 591.5(j) is from "NHTSA", whereas elsewhere it is from "the Administrator". For consistency, and to reflect the fact that the Administrator acts as the Secretary's delegate under

the National Traffic and Motor Vehicle Safety Act, section 591.5(j) is also amended, to substitute "the Administrator" for "NHTSA".

Notice

The agency does not believe that any of the amendments made in this document need be preceded by notice and opportunity for comment. They are generally either technical or conforming amendments. Further, the agency needs to proceed expeditiously because of the imminence of the January 31, 1990 statutory effective date for the statutory amendments regarding the importation of nonconforming vehicles, and because of the need to print and distribute new importation forms prior to that date.

In consideration of the foregoing, Part 591 of 49 CFR is amended as follows:

1. In section 591.4, the following definition is added immediately following the definition of "Administrator":

"*Dutiable value* means entered value, as determined by the Secretary of the Treasury."

2. In section 591.5(b), the phrase "by the manufacturer" is inserted between the words "or" and "to the equipment item".

3. In section 591.5(e), the phrase that follows the comma appearing after the word "painting" is deleted. The comma is removed and replaced with a period.

4. In section 591.5(f)(1), the term "entered value" is deleted and the term "dutiable value" is substituted in its place.

5. Section 591.5(h) is revised to read:

(h) The vehicle does not conform with all applicable Federal motor vehicle safety standards, but the importer is eligible to import it because (s)he:

(1)(i) is a member of the personnel of a foreign government on assignment in the United States, or a member of the Secretariat of a public international organization so designated under the International Organization Immunities Act, and within the class of persons for whom free entry of motor vehicles has been authorized by the Department of State;

(ii) is importing the motor vehicle on a temporary basis for the personal use of the importer, and will register it through the Office of Foreign Missions of the Department of State;

(iii) will not sell the vehicle to any person in the United States, other than a person eligible to import a vehicle under this paragraph; and

(iv) will obtain from the Office of Foreign Missions of the Department of State, before departing the United States at the conclusion of a tour of duty, an ownership title to the vehicle good for export only; or

(2)(i) is a member of the armed forces of a foreign country on assignment in the United States;

(ii) is importing the vehicle on a temporary basis, and for the personal use of the importer;

(iii) will not sell the vehicle to any person in the United States, other than to a person eligible to import a vehicle under this subsection; and

(iv) will export the vehicle upon departing the United States at the conclusion of a tour of duty.

6. In section 591.5(j), the semicolon in subsection (j)(5), and the concluding phrase of section (j) "and the importer has received written permission from NHTSA." are removed. Subsection (j)(5) is revised to read "(5) competitive racing events, and will not be licensed for use on the public roads."

7. In section 591.6(f), all text after the first sentence is deleted.

8. A new section 591.6(g) is added to read:

(g) A declaration made pursuant to section 591.5(j) shall be accompanied by a full and complete statement identifying the specific purpose(s) of importation, describing the use to be made of the vehicle or equipment item, and stating the estimated period of time necessary to use the vehicle or equipment item on the public roads, if any, and the disposition to be made of the vehicle or equipment item after completion of the purpose for which it was imported. If the importer does not intend to conform, export, or destroy the vehicle or equipment item not later than 3 years after its entry, the importer shall request permission in writing from the Administrator for the vehicle of equipment item to remain in the United States for an additional period of time, subject to the limitations of section 591.7(c).

Issued on January 31, 1990

Jeffrey R. Miller
Deputy Administrator

55 F.R. 3742
February 5, 1990

PREAMBLE TO AN AMENDMENT TO PART 591
Importation of Motor Vehicles and Equipment
(Docket No. 89-5; Notice 5)
RIN 2127-AD00

ACTION: Final rule; corrections.

SUMMARY: On February 5, 1990, NHTSA published its response to petitions for reconsideration of the final rule on the importation of motor vehicles and equipment subject to the Federal motor vehicle safety standards. NHTSA deleted the requirement under section 591.6(f) that an importer obtain written permission to license nonconforming vehicles which are imported under section 591.5(j) for use on the public roads. Through an oversight, the corresponding provision in section 591.7(c) was not deleted. This notice makes such a deletion. Section 591.5(f)(1) was amended to substitute the term "dutiable value" for "entered value," but an identical change was not made to section 591.6(c). This notice makes the change. Finally, the agency notes that sections other than section 591.6(g) are referred to in the text as "paragraphs," whereas the preferred Federal Register usage is "section." Conforming changes are made where appropriate.

DATE: The corrections are effective February 28, 1990.

SUPPLEMENTARY INFORMATION: On February 5, 1990, NHTSA published its response (Notice 4) to the petitions for reconsideration of 49 CFR Part 591 *Importation of Vehicles and Equipment Subject to the Federal Motor Vehicle Safety Standards* (55 FR 3742). In response to these petitions, NHTSA deleted the requirement that written approval be obtained from the Administrator under section 591.6(f) prior to the importation of vehicles intended to be imported pursuant to section 591.5(j), that is, imported for the purpose of research, investigations, studies, demonstrations or training, and competitive racing events. Part of the deleted paragraph (f) required the prospective importer to request permission to license the vehicle on the public roads if use on the public roads was an integral part of the purpose for which the vehicle was imported. In making this deletion, NHTSA overlooked the restriction upon importation contained in section 591.7(c), that an importer of a vehicle which had entered the United States under a declaration made pursuant to section 591.5(j) may license it for use on the public roads only if written permission has been granted by the Administrator pursuant to section 591.6(f). Thus, the notice published on February 5 deleted the referent and the requirement it contained. This notice completes the prior rulemaking by also deleting section 591.7(c).

The Imported Vehicle Safety Compliance Act of 1988 specifies that conformance bonds shall be based upon "dutiable value." Part 591 as originally adopted used the term "entered value," which the agency understood was the term now in use by the U.S. Customs Service. However, upon reflection, NHTSA adopted a definition of "dutiable value" in the February 5 notice, specifying it to be the entered value of merchandise as determined by the Secretary of the Treasury. The term "entered value" appeared in two places in Part 591, but through an oversight, only one of these (section 591.5(f)(1)) was changed. This notice corrects the second of these, appearing in section 591.6(c).

The February 5 notice also used the term "section" in an internal reference to another part of the regulation. However, review of the regulation indicates that the word "paragraph" is in general use. NHTSA understands that the usage preferred by the Federal Register is "section" when a complete citation is given, i.e., "section 591.6(c)," and that the word "paragraph" should be used when the citation is to an internal part of a section, *e.g.*, "paragraph (c) of this section." Corrections are made where required. Finally, a typographical error appearing in new section 591.6(g) is corrected.

Because these amendments are corrective in nature, it is hereby found that notice and public comment thereon are unnecessary, and that they may become effective upon publication in the *Federal Register.* As they make no substantive changes, they do not affect any of the impacts previously considered in relation to Part 591.

In consideration of the foregoing, Part 591 of 49 CFR is amended as follows:

1. In section 591.6(c) the phrase "entered value of the vehicle as determined by the Secretary of the

Treasury" is deleted, and the phrase "dutiable value of the vehicle" is substituted.

2. In the final sentence of section 591.6(g), the word "of" is changed to "or."

3. The word "paragraph" is changed to "section" wherever it appears in the introductory text to section 591.6, and in paragraphs (a), (b), (b)(1), (c), (d), (e), and (f) of section 591.6, and in sections 591.7(a) and (b).

4. Section 591.7(c) is deleted.

Issued on: February 22, 1990

Jeffrey R. Miller
Deputy Administrator

55 F.R. 6994
February 28, 1990

PREAMBLE TO AN AMENDMENT TO PART 591
Importation of Motor Vehicles and Equipment
(Docket No. 89-5; Notice 6)
RIN 2127-AD00

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend the recently adopted regulation of the National Highway Traffic Safety Administration governing importation of motor vehicles and equipment subject to the Federal motor vehicle safety standards. The first amendment adds the agency's bumper and theft prevention standards to those Federal standards for which conformity is necessary for permanent importation of a motor vehicle into the United States. Although conformity of imported cars with these standards is required by statute, current importation regulations have never been amended to include them. The second amendment extends coverage of the bond required by NHTSA for a demonstration of conformity with the safety standards, to vehicles imported between January 31, 1990, and October 31, 1992, by importers who owned the vehicle as of October 31, 1988, and whose assigned place of employment was outside the U.S. at times from that date until the time of importation. This bond supersedes the current equivalent Customs bond. The third amendment specifies the terms and conditions of the two NHTSA bonds. The final amendment adopts procedures for submitting petitions for remission and mitigation of bond forfeiture.

EFFECTIVE DATE: March 28, 1990.

SUPPLEMENTARY INFORMATION: On October 31, 1988, the President signed P.L. 100-562, the Imported Vehicle Safety Compliance Act of 1988 ("the 1988 Act"). A notice of proposed rulemaking to establish Part 591 was published on April 25, 1989 (54 FR 17772), and a final rule on September 29, 1989 (54 FR 40069). As the notices stated, the 1988 Act amends those provisions of the National Traffic and Motor Vehicle Safety Act of 1966 ("the Vehicle Safety Act") that relate to the importation of motor vehicles subject to the Federal motor vehicle safety standards (section 108(b), 15 U.S.C. 1397(b)). The importation of motor vehicles subject to the Federal motor vehicle bumper standard (15 U.S.C. 1916), and the Federal motor vehicle theft prevention standard (15 U.S.C. 601) was not included in these changes. Importation of passenger motor vehicles subject to the bumper standard is to be governed by joint regulations of both NHTSA and the Secretary of the Treasury (15 U.S.C. 1916(b)(3)), under terms and conditions (including the furnishing of a bond) sufficient to ensure their conformance, or their exportation or abandonment to the United States. Importation of vehicles and equipment subject to the theft prevention standard is flatly prohibited unless vehicles and equipment conform at time of entry. In reviewing agency programs, NHTSA and Customs have agreed that regulatory simplicity requires that all vehicles subject to NHTSA's standards should be imported pursuant to a NHTSA regulation. Accordingly, a notice was published on November 29, 1989, proposing amendments of Part 591 to add the Federal bumper and theft prevention standards to its coverage (54 FR 49098). Comments on the notice were received from Ford Motor Co., Mercedes-Benz of North America, and National Automobile Dealers Association. The comments were non-substantive in nature, and supported the proposal. Because of the importance of this matter, the agency is repeating the preamble of the proposal.

The Federal Bumper Standard

Title I of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 *et seq.*) was enacted in 1972, and required NHTSA to promulgate bumper standards applicable to all passenger motor vehicles imported into the United States. In implementation of this requirement, NHTSA issued 49 CFR Part 581, *Bumper Standard*, effective September 1, 1978. The importation provisions in the Cost Saving Act for vehicles subject to the bumper standards were substantially similar to those for vehicles subject to the safety standards. No standard was to apply to a vehicle intended solely for export and so labeled or tagged. No person was to import a passenger motor vehicle manufactured on or after the effective date of a bumper standard unless it was in conformity with such a standard. However, it could be admitted under the joint regulations of the Secretaries of Treasury and Transportation under such terms and

conditions (including the furnishing of a bond) as appeared appropriate to ensure conformity, or exportation or abandonment to the United States. The joint regulations could also provide for the "importation" (as contrasted with the "temporary importation" allowed by the Vehicle Safety Act) of any passenger motor vehicle after its first purchase for purposes other than resale.

However, the joint regulation that applied to the importation of vehicles subject to the Federal safety standards, 19 CFR 12.80, was never amended to incorporate the bumper standard, although NHTSA enforced it as part of its importation compliance procedures. With the advent of NHTSA's own vehicle importation regulation, 49 CFR Part 591, this notice adds bumper standard importation requirements to the declarations required for entry, and amends the bond provisions to include compliance with the bumper standard. To fulfill the statutory requirement for joint issuance, the final rule is jointly issued under the authority of both regulatory agencies.

The bumper declarations and requirements are virtually identical with those required for the safety standards. There is one exception, however. NHTSA has interpreted the 1988 Act as requiring a showing of total compliance with the safety standards, or exportation or abandonment of the motor vehicle to the United States. NHTSA does not read the Cost Savings Act as imposing the same punishment in the absence of such a showing regarding the bumper standard. Therefore, in the event that a passenger motor vehicle demonstrates compliance with the safety standards, but not the bumper standard, the agency may choose to levy a penalty upon the bond instead of demanding export or abandonment of the vehicle, if the facts appear to justify it.

The Theft Prevention Standard

Title VI of the Cost Savings Act (15 U.S.C. 601 *et seq.*) requires NHTSA to issue a vehicle theft prevention standard that applies to "covered major parts which are installed by manufacturers into passenger motor vehicles in lines designated . . . as high theft lines," and the major replacement parts for those major parts. In implementation of this requirement, NHTSA issued 49 CFR Part 541, *Federal Motor Vehicle Theft Prevention Standard,* effective April 24, 1986. Conformance with this standard requires the marking of certain original and replacement parts in the manner specified in the standard. Unlike the statutory importation requirements for safety and bumper standards, Title VI contains a flat prohibition against the importation of vehicles and parts which are subject to the theft prevention standard, but are not marked in accordance with it. Therefore, vehicles and parts covered by the theft prevention standard must comply before their importation into the United States, whether the marking is affixed by the importer, or original manufacturer. In terms of Part 591, this means that an importer must declare that his vehicle meets the theft prevention standard, even if it is accompanied by a declaration of nonconformance with the safety and bumper standards. If, in the first instance, the vehicle does not meet the theft prevention standard, it will not be allowed entry under bond or otherwise for the eventual production of a conformity statement. Admission under a false declaration may constitute a violation of the regulations of the Customs Service, and result in seizure of the vehicle.

This notice adopts appropriate changes in the language of the declarations, and also a new paragraph 591.5(k) that applies to replacement parts. It requires a declaration of conformity with the theft prevention standard by the importer of any major part covered by the standard.

Bonds for Those Eligible to Import Under Present Regulation.

Under certain circumstances, and for a limited time, section 108(g) of the Vehicle Safety Act permits a nonresident (including any member of the Armed Forces) to continue to import a vehicle under the present regulation, that is, the Administrator need not have made a determination that it is capable of conformance, and conformance work need not be performed by a registered importer. This exception applies to a single vehicle imported, for personal use and not for resale, between January 31, 1990, and October 31, 1992, by an individual whose assigned place of employment was outside the United States for the total period between October 31, 1988, and the date of importation, provided that the vehicle was acquired (or was subject to a binding contract to acquire) before October 31, 1988, and that the individual has not previously imported a nonconforming motor vehicle. Importation under this amendment is reflected in section 591.5(g).

NHTSA and Customs have agreed that as of January 31, 1990, all bonds given for conformance with the safety standards should be those of NHTSA. Therefore, appropriate inclusory language is adopted in this notice.

Conditions of the Conformance Bond

In its response to the proposal of Part 591, General Motors commented that Part 591 did not state the conditions of the bond. With the determination by Customs and NHTSA that the bond will be that of NHTSA, it is now possible for this agency to state those conditions. In general, they include the acts that the statute requires importers or registered importers to perform after entry of a vehicle and before its release. The bond is given to secure com-

pliance with the Federal motor vehicle safety standards, and, if the vehicle has been imported under section 108(c) of the Vehicle Safety Act, no mitigation of the bond is contemplated for vehicles that appear to conform only partially with the safety standards. If full conformance with the safety standards is not achieved, the vehicle must be exported, or abandoned to the U.S. If none of these actions occur, the bond is forfeited. If a vehicle has been brought into full conformance with the safety standards, but not the bumper standard, NHTSA may not demand export or abandonment, but only a partial forfeiture of the bond. This differs from the practice under the present bond (in effect until January 31, 1990), which will continue until October 31, 1992, for vehicles imported pursuant to section 108(g). Under this condition, the principal submits a statement identifying the conforming party, and discussing the nature and extent of the work performed in the conformance process, within 120 days after entry (or longer, if the Administrator allows it). It has been the practice of Customs to release vehicles under a partial forfeiture of the bond when complete compliance has not been documented, and the vehicle has not been returned for export. A further condition of the bond for vehicles imported pursuant to section 108(c) is that the principal will make the vehicle available for inspection upon demand by NHTSA, and will not release it from custody before 30 days had passed after its submission of conformance certification to NHTSA. A further condition of the bond for vehicles imported pursuant to section 108(g) is that the principal will not sell the vehicle, or offer it for sale, until a statement had been issued by NHTSA that it is acceptable to do so.

These conditions are now set forth in sections 591.8(f) and (g). The bond that will apply to importers of vehicles pursuant to section 108(c) of the Act is depicted at Annex A. The bond that will apply to importers of vehicles pursuant to section 108(g) is depicted at Annex B.

Petitions for Remission or Mitigation

In the event a bond is forfeited, a principal and/or surety may petition the Administrator for remission of the forfeiture. If the Administrator finds that all conditions of the bond have been, in fact, fulfilled, the forfeiture is remitted.

A petition may also be submitted for mitigation of the forfeiture. However, given the intent of the 1988 Act that the Federal motor vehicle safety standards be enforced more strictly than before, the agency has concluded that mitigation of forfeiture is inappropriate if a vehicle has been imported pursuant to new section 108(c) of the Vehicle Safety Act, and is not brought into compliance with all safety standards. Arguably, failure to conform should occur infrequently in the future. This is because a vehicle will not be admitted unless the agency has determined that it is capable of conformance, and the conformance work will be performed by those who have registered with NHTSA as undertaking to provide certifications that vehicles have been brought into conformity.

This restriction will not apply to importers of vehicles under section 108(g). Vehicles imported pursuant to this provision are exempt from eligibility determinations and need not be conformed by registered importers. If these vehicles fail to comply fully with the standards, and are not exported or abandoned, the bond will be forfeit, but the Administrator will entertain petitions for mitigation, just as the Customs Service does under the existing regulations.

Nor will the restriction apply to either category of importer if the condition of the bond that is not met relates to compliance with Part 581, the Federal bumper standard. The primary purpose of this standard is the preservation of property, rather than the prevention of deaths and injuries. The fact that Congress draws a distinction is found in the permissive authority of the two Secretaries that allows importation of used passenger motor vehicles whether or not they comply with the bumper standard (15 U.S.C. 1916(b)(4)), but forbids the importation of vehicles that do not comply with safety standards unless the vehicles are brought into compliance with them.

These provisions are adopted as section 591.9.

Miscellaneous

The signature of the Assistant Secretary of Treasury on this notice represents that Department's exercise of its share of the joint authority provided for implementation of importation provisions of Title I (relating to bumpers) of the Motor Vehicle Information and Cost Savings Act. It is understood that implementation of Title VI (relating to theft) of that Act is under the sole authority of the Department of Transportation.

In consideration of the foregoing, PART 591 of 49 CFR is amended to read as follows:

1. The authority section is revised to read:

Authority: P.L. 100-562, 15 U.S.C. 1401, 1407, 1912, 1916, 2022, 2027; delegation of authority at 49 CFR 1.50.

2. The title of Part 591 is revised to read "PART 591—IMPORTATION OF VEHICLES AND EQUIPMENT SUBJECT TO FEDERAL SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS"

3. Under the section heading "Sec.," new sections 591.8 and 591.9 are added to read:

591.8 Conformance bond and conditions.

591.9 Petitions for remission or mitigation of forfeiture.

4. Sections 591.1, 591.2, and 591.3 are revised to read:

591.1 *Scope.*

This part establishes procedures governing the importation of motor vehicles and motor vehicle equipment subject to the Federal motor vehicle safety, bumper, and theft prevention standards.

591.2 *Purpose.*

The purpose of this part is to ensure that motor vehicles and motor vehicle equipment permanently imported into the United States conform with theft prevention standards issued under Part 541 of this chapter and that they conform with, or are brought into conformity with, all applicable Federal motor vehicle safety standards issued under Part 571 of this chapter and bumper standards issued under Part 581 of this chapter. The purpose of this part is also to ensure that nonconforming vehicles and equipment items imported on a temporary basis are ultimately either exported or abandoned to the United States.

591.3 *Applicability.*

This part applies to any person offering a motor vehicle or item of motor vehicle equipment for importation into the United States.

5. The first sentence of paragraph 591.4 is revised to read:

591.4 *Definitions.*

All terms used in this part that are defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391), and section 2 and section 601 of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 and 2021), are used as defined in the Acts, except that the term "model year" is used as defined in Part 593 of this chapter.

6. Sections 591.5(a), (b), and (c) are revised to read:

591.5 *Declarations required for importation.*

No person shall import a motor vehicle or item of motor vehicle equipment into the United States unless, at the time it is offered for importation, its importer files a declaration, in duplicate, which declares one of the following:

(a)(1) The vehicle was not manufactured primarily for use on the public roads and thus is not a motor vehicle subject to the Federal motor vehicle safety, bumper, and theft prevention standards; or

(2) The equipment item is not a system, part, or component of a motor vehicle and thus is not an item of motor vehicle equipment subject to the Federal motor vehicle safety, bumper, and theft prevention standards.

(b) The vehicle or equipment item conforms with all applicable safety standards (or the vehicle does not conform solely because readily attachable equipment items which will be attached to it before it is offered for sale to the first purchaser for purposes other than resale are not attached), and bumper and theft prevention standards, and bears a certification label or tag to that effect permanently affixed by the original manufacturer to the vehicle, or to the equipment item or its delivery container, in accordance with, as applicable, Parts 541, 555, 567, 568, and 581, or 571 (for certain equipment items) of this chapter.

(c) The vehicle or equipment item does not comply with all applicable Federal motor vehicle safety, bumper, and theft prevention standards, but is intended solely for export, and the vehicle or equipment item, and the outside of the container of the equipment item, if any, bears a label or tag to that effect.

7. The incomplete sentence in section 591.5(d) is revised to read:

(d) The vehicle does not conform with all applicable Federal motor vehicle safety, bumper, and theft prevention standards, but the importer is eligible to import it because:

8. Section 591.5(e) is revised to read:

(e) The vehicle or equipment item requires further manufacturing operations to perform its intended function, other than the addition of readily attachable equipment items such as mirrors, wipers, or tire and rim assemblies, or minor finishing operations such as painting, and any part of such vehicle that is required to be marked by Part 541 of this chapter is marked in accordance with that Part.

9. Sections 591.5(f) and (f)(1) are revised to read:

(f) The vehicle does not conform with all applicable Federal motor vehicle safety and bumper standards (but does conform with all applicable Federal theft prevention standards), but the importer is eligible to import it because:

(1) The importer has furnished a bond, which is attached to the declaration, in an amount equal to 150% of the dutiable value of the vehicle, containing the terms and conditions specified in section 591.8; and

10. The incomplete sentence in section 591.5(g) is revised to read:

(g) The vehicle does not conform with all applicable Federal motor vehicle safety and bumper standards (but it does conform with all applicable Federal theft prevention standards), but the importer is eligible to import it because:

11. In section 591.5(g), new subparagraphs (g)(5), (g)(6), and (g)(7) are added to read:

(5) The importer has furnished a bond, which is attached to the declaration, in an amount equal to 150% of the entered value of the vehicle as determined by the Secretary of the Treasury, containing the terms and conditions specified in section 591.8;

(6) The vehicle was not manufactured in conformity with all applicable safety and bumper standards, but it has been or will be brought into

conformity; furthermore, within 120 days after entry or such additional time not to exceed 180 days after entry as the Administrator may allow, the importer will submit a true and complete statement to the Administrator, identifying the manufacturer, contractor, or other person who has brought the vehicle into conformity, describing the exact nature and extent of the work performed, and certifying that the vehicle or equipment item has been brought into conformity; and

(7) The importer will not sell the vehicle, or offer it for sale, until the Administrator issues a statement that the conditions of the bond required by section 591.6(c) have been satisfied.

12. The incomplete sentence in section 591.5(h) is revised to read:

(h) The vehicle does not conform with all applicable Federal motor vehicle safety, bumper, and theft prevention standards, but the importer is eligible to import it because:

13. Section 591.5(i)(2) is revised to read:

(i)(2) The equipment item was manufactured on a date when no applicable safety or theft prevention standard was in effect.

14. The incomplete sentence in section 591.5(j) is revised to read:

(j) The vehicle or equipment item does not conform with all applicable Federal motor vehicle safety, bumper, and theft prevention standards, but is being imported solely for the purpose of:

15. A new section 591.5(k) is added to read:

(k) The equipment item is subject to the theft prevention standard, and is marked in accordance with the requirements of Part 541 of this chapter.

16. Section 591.6(c) is revised to read:

(c) A declaration made pursuant to section 591.5(f) or section 591.5(g) shall be accompanied by a bond in the form shown in Annex A or Annex B of this Part, respectively, in an amount equal to 150% of the dutiable value of the vehicle for the conformance of the vehicle with all applicable Federal motor vehicle safety and bumper standards, or, if conformance with the safety standards is not achieved, for the delivery of such vehicle to the Secretary of the Treasury for export at no cost to the United States, or for its abandonment.

17. New sections 591.8 and 591.9 are added to read:

591.8 *Conformance bond and conditions.*

(a) The bond required under section 591.6(c) for importation of a vehicle not originally manufactured to conform with all applicable standards issued under Part 571 and Part 581 of this chapter shall cover only one motor vehicle, and shall be in an amount equal to 150% of the dutiable value of the vehicle.

(b) The principal on the bond shall be the importer of the vehicle.

(c) The surety on the bond shall possess a certificate of authority to underwrite Federal bonds. (See list of certificated sureties at 54 FR 27800, June 30, 1989)

(d) In consideration of the release from the custody of the U.S. Customs Service or the withdrawn from a Customs bonded warehouse into the commerce of, or for consumption in, the United States, of a motor vehicle not originally manufactured to conform to all applicable standards issued under Part 571 and Part 581 of this chapter, the obligors (principal and surety) shall agree to the following conditions of the bond:

(i) To have such vehicle brought into conformity with all applicable standards issued under Part 571 and Part 581 of this chapter within 120 days after the date of entry;

(ii)

(1) In the case of a vehicle imported pursuant to section 591.5(f), to file (or if not a Registered Importer, to cause the Registered Importer of the vehicle to file) with the Administrator, a certificate that the vehicle complies with each Federal motor vehicle safety and bumper standard in the year that the vehicle was manufactured and which applies in such year to the vehicle; or

(2) In the case of a vehicle imported pursuant to section 591.5(g), to submit a true and complete statement to the Administrator, identifying the manufacturer, contractor, or other person who has brought the vehicle into conformity, describing the exact nature and extent of the work performed, and certifying that the vehicle has been brought into conformity with each Federal motor vehicle safety and bumper standard in the year that such vehicle was manufactured and which applies in such year to the vehicle.

(iii) In the case of a Registered Importer, not to release custody of the vehicle to any person for license or registration for use on public roads, streets, or highways, or license or register the vehicle from the date of entry until 30 calendar days after it has certified compliance of the vehicle to the Administrator, unless the Administrator has notified the principal before 30 calendar days that (s)he has accepted such certification, and that the vehicle and bond may be released, except that the vehicle shall not be released if the principal has received written notice from the Administrator that an inspection of the vehicle will be required, or that there is reason to believe that such certification is false or contains a misrepresentation;

(iv) In the case of a Registered Importer, to cause the vehicle to be available for inspection, if the principal has received written notice from the Administrator that an inspection is required.

(v) In the case of a Registered Importer, not to

release the vehicle until the Administrator is satisfied with the certification and any modification thereof, if the principal has received written notice from the Administrator that there is reason to believe that the certificate is false or contains a misrepresentation.

(vi) If the principal has received written notice from the Administrator that the vehicle has been found not to comply with all applicable Federal motor vehicle safety standards, and written demand that the vehicle be abandoned to the United States, or delivered to the Secretary of the Treasury for export (at no cost to the United States), to abandon the vehicle to the United States, or to deliver the vehicle, or cause the vehicle to be delivered to, the custody of the District Director of Customs of the port of entry listed above, or to any other port of entry, and to execute all documents necessary for exportation of the vehicle from the United States, at no cost to the United States; or in default of abandonment or redelivery after proper notice by the Administrator to the principal, to pay to the Administrator the amount of the bond.

(e) If the principal defaults on the obligation of paragraph (d)(vi) of this section, to abandon the vehicle to the United States or to redeliver the vehicle to the custody of a District Director of Customs and to execute all documents necessary for its exportation, the obligors shall pay to the Administrator the amount of the bond given under the provisions of this section.

591.9 *Petitions for remission or mitigation of forfeiture.*

(a) After a bond has been forfeited, a principal and/or a surety may petition for remission of forfeiture. A principal and/or a surety may petition for mitigation of forfeiture only if the motor vehicle has been imported pursuant to section 591.5(g), or, if imported pursuant to section 591.5(f), only if the condition not met relates to the compliance of a passenger motor vehicle with Part 581 of this chapter.

(b) A petition for remission or mitigation shall:

(1) Be addressed to the Administrator, identified as either a petition for remission or for mitigation, submitted in triplicate, and signed by the principal and/or the surety.

(2) State the make, model, model year, and VIN of the vehicle involved, and contain the Customs Entry number under which the vehicle entered the United States.

(3) State the facts and circumstances relied on by the petitioner to justify remission or mitigation.

(4) Be filed within 30 days from the date of the mailing of the notice of forfeiture incurred.

(c) A false statement contained in a petition may subject the petitioner to prosecution under the provisions of 18 U.S.C. 1001.

(d) If the Administrator finds that all conditions of the bond have, in fact, been fulfilled, the forfeiture is remitted.

(e) A decision to mitigate a forfeiture upon condition that a stated amount is paid shall be effective for not more than 60 days from the date of notice to the petitioner of such decision. If payment of the stated amount is not made, or arrangements made for delayed or installment payment, the full claim of forfeiture shall be deemed applicable. The Administrator shall collect the claim, or, if unable to collect the claim within 120 days, shall refer the matter to the Department of Justice.

18. Annex A and Annex B are added to this Part as follows:

Issued on: March 19, 1990

Jerry Ralph Curry
Administrator

Acting Assistant Secretary
(Enforcement)
Department of the Treasury

55 F.R. 11375
March 28, 1990

Department of Transportation
National Highway Traffic Safety Administration

BOND TO ENSURE CONFORMANCE WITH MOTOR VEHICLE SAFETY AND BUMPER STANDARDS

(To redeliver vehicle, to produce documents, to perform conditions of release, such as to bring vehicle into conformance with all applicable Federal motor vehicle safety and bumper standards)

Know All Men by These Presents That ______________________________

____
name of principal or surety; if a corporation, the State of incorporation

of ______________________________, as principal,
street address or post office box number; city; state; ZIP code

and ______________________________ of ______________________________,
name; State of incorporation, if any — address

and ______________________________ of ______________________________,
name; State of incorporation, if any — address

as sureties, are held and firmly bound unto the UNITED STATES OF AMERICA

in the sum of ______________________________

______________________________ dollars ($ ______________),

which represents 150% of the entered value of the following described motor vehicle as determined by the U.S. Customs Service:

____
model year, make, series, engine and chassis numbers

for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns (jointly and severally), firmly by these presents

WITNESS our hands and seals this ______________ day of ______________________, 199__

WHEREAS, motor vehicles may be entered under the provisions of section 108 of the National Traffic and Motor Vehicle Safety Act, and section 106 of the Motor Vehicle Information and Cost Savings Act; and

DOT Form XXXX

WHEREAS, pursuant to 49 CFR Part 591, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, the above-bounden principal desires to import permanently the motor vehicle described above, which is a motor vehicle that was not originally manufactured to conform with the Federal motor vehicle safety and bumper standards; and

WHEREAS, pursuant to 49 CFR Part 592, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, as amended, the above-bounden principal has been granted the status of Registered Importer of motor vehicles not originally manufactured to conform with the Federal motor vehicle safety standards (or, if not a Registered Importer, has a contract with a Registered Importer covering the motor vehicle described above); and

WHEREAS, pursuant to 49 CFR Part 593, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, as amended, the Administrator of the National Highway Traffic Safety Administration has determined that the motor vehicle described above is eligible for importation into the United States; and

WHEREAS, the motor vehicle described above has been imported at the port of ________________, and

entered at said port for consumption on entry No. ________________, dated ________________, 199__,

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT—

(1) The above-bounden principal (the "principal"), in consideration of the permanent admission into the United States of the motor vehicle described above (the "vehicle"), voluntarily undertakes and agrees to have such vehicle brought into conformity with all applicable Federal motor vehicle safety and bumper standards within a reasonable time after such importation, as specified by the Administrator of the National Highway Traffic Safety Administration (the "Administrator");

(2) The principal shall then file, or if not a Registered Importer, shall then cause the Registered Importer of the vehicle to file, with the Administrator, a certificate that the vehicle complies with each Federal motor vehicle safety standard in the year that the vehicle was manufactured and which applies in such year to the vehicle, and that the vehicle complies with the Federal bumper standard (if applicable);

(3) The principal, if a Registered Importer, shall not release custody of the vehicle to any person for license or registration for use on public roads, streets, or highways, or license or register the vehicle from the date of entry until 30 calendar days after it has certified compliance of the vehicle to the Administrator, unless the Administrator notifies the principal before 30 calendar days that (s)he has accepted such certification and the vehicle and bond may be released, except that no such release shall be permitted, before or after the 30th calendar day, if the principal has received written notice from the Administrator that an inspection of such vehicle will be required, or that there is reason to believe that such certification is false or contains a misrepresentation;

(4) And if the principal has received written notice from the Administrator that an inspection is required, the principal shall cause the vehicle to be available for inspection, and the vehicle and bond shall be promptly released after completion of an inspection showing no failure to comply. However, if the inspection shows a failure to comply, the vehicle and bond shall not be released until such time as the failure to comply ceases to exist;

(5) And if the principal has received written notice from the Administrator that there is reason to believe that the certificate is false or contains a misrepresentation, the vehicle or bond shall not be released until the Administrator is satisfied with the certification and any modification thereof;

(6) And if the principal has received written notice from the Administrator that the vehicle has been found not to comply with all applicable Federal motor vehicle safety and bumper standards, and written demand that the vehicle be abandoned to the United States, or delivered to the Secretary of the Treasury for export (at no

cost to the United States), the principal shall abandon the vehicle to the United States, or shall deliver the vehicle, or cause the vehicle to be delivered to, the custody of the District Director of Customs of the port of entry listed above, or any other port of entry, and shall execute all documents necessary for exportation of the vehicle from the United States, at no cost to the United States; or in default of abandonment or redelivery after proper notice by the Administrator to the principal, the principal shall pay to the Administrator the amount of this obligation;

Then this obligation shall be void; otherwise it shall remain in full force and effect.

Signed, sealed, and delivered in the presence of—

____
Name Address

____ ____________________ (SEAL)
Name Address (Principal)

____
Name Address

____ ____________________ (SEAL)
Name Address (Surety)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, ______________________________ certify that I am the __________________________________

of the corporation named as principal in the within bond; that ____________________________________

______________________________________, who signed the bond on behalf of the principal, was then

______________________________ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

______________________________ [Corporate Seal]

To be used when a power of attorney has been filed with NHTSA
May be executed by secretary, assistant secretary, or other officer

ANNEX A

Bond for importations of motor vehicles under section 591.5(f)

Department of Transportation
National Highway Traffic Safety Administration

BOND TO ENSURE CONFORMANCE WITH MOTOR VEHICLE SAFETY AND BUMPER STANDARDS

(To redeliver vehicle, to produce documents, to perform conditions of release, such as to bring vehicle into conformance with all applicable Federal motor vehicle safety and bumper standards)

Know All Men by These Presents That ____

____

name of principal or surety; if a corporation, the State of incorporation

of ____, as principal,
street address or post office box number; city; state; ZIP code

and ______________________________________ of ______________________________,
name; State of incorporation, if any — address

and ______________________________________ of ______________________________,
name; State of incorporation, if any — address

as sureties, are held and firmly bound unto the UNITED STATES OF AMERICA

in the sum of ____

______________________________________ dollars ($ ____________________),

which represents 150% of the entered value of the following described motor vehicle as determined by the U.S. Customs Service:

____

model year, make, series, engine and chassis numbers

for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns (jointly and severally), firmly by these presents

WITNESS our hands and seals this ______________ day of ______________________, 199__

WHEREAS, motor vehicles may be entered under the provisions of section 108 of the National Traffic and Motor Vehicle Safety Act, and section 106 of the Motor Vehicle Information and Cost Savings Act; and

DOT Form XXXX

WHEREAS, pursuant to 49 CFR Part 591, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, the above-bounden principal desires to import permanently the motor vehicle described above, which is a motor vehicle that was not originally manufactured to conform with the Federal motor vehicle safety and bumper standards; and

WHEREAS, pursuant to paragraph 591.5(g) of 49 CFR Part 591, a regulation promulgated under the provisions of section 108, the above-bounden principal is eligible to import a motor vehicle under the provisions thereof: to wit, the above-bounden principal's assigned place of employment was outside the United States as of October 31, 1988, and (s)he has not had an assigned place of employment in the United States between that date and the date of entry of the motor vehicle described above, and (s)he has not previously imported a motor vehicle into the United States manufactured on or after January 1, 1968, and (s)he had acquired (or had entered into a binding contract to acquire) the motor vehicle described above not later than October 31, 1988, and (s)he will enter the motor vehicle described above not later than October 31, 1992; and

WHEREAS, the motor vehicle described above has been imported at the port of ____________________, and

entered at said port for consumption on entry No. ____________________, dated ____________________, 199__,

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT—

(1) The above-bounden principal (the "principal"), in consideration of the permanent admission into the United States of the motor vehicle described above (the "vehicle"), voluntarily undertakes and agrees to have such vehicle brought into conformity with all applicable Federal motor vehicle safety and bumper standards within 120 days after such importation, or such longer time not to exceed 180 days after such importation, as specified by the Administrator of the National Highway Traffic Safety Administration (the "Administrator");

(2) When the vehicle has been brought into conformity, the principal shall then file with the Administrator, a true and complete statement that the vehicle complies with each Federal motor vehicle safety standard in the year that the vehicle was manufactured and which applies in such year to the vehicle, and that the vehicle also complies with the Federal bumper standard;

(3) The principal shall not offer the vehicle for sale, or sell the vehicle, until the principal has received written notice from the Administrator that the principal has fulfilled all the conditions of the bond.

(4) And if the principal has received written notice from the Administrator that an inspection is required, the principal shall cause the vehicle to be available for inspection, and the vehicle and bond shall be promptly released after completion of an inspection showing no failure to comply. However, if the inspection shows a failure to comply, the vehicle and bond shall not be released until such time as the failure to comply ceases to exist;

(5) And if the principal has received written notice from the Administrator that there is reason to believe that the statement is false or contains a misrepresentation, the vehicle or bond shall not be released until the Administrator is satisfied with the statement and any modification thereof;

(6) And if the principal has received written notice from the Administrator that the vehicle has been found not to comply with all applicable Federal motor vehicle safety and bumper standards, and written demand that the vehicle be abandoned to the United States, or delivered to the Secretary of the Treasury for export (at no cost to the United States), the principal shall abandon the vehicle to the United States, or shall deliver the vehicle, or cause the vehicle to be delivered to, the custody of the District Director of Customs of the port of entry listed above, or any other port of entry, and shall execute all documents necessary for exportation of the vehicle from the United States, at no cost to the United States; or in default of abandonment or redelivery after proper notice by the Administrator to the principal, the principal shall pay to the Administrator the amount of this obligation;

Then this obligation shall be void; otherwise it shall remain in full force and effect.

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, ______________________________ certify that I am the __________________________________

of the corporation named as principal in the within bond; that ___________________________________

_______________________________________, who signed the bond on behalf of the principal, was then

____________________________________ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

______________________________ [Corporate Seal]

To be used when a power of attorney has been filed with NHTSA
May be executed by secretary, assistant secretary, or other officer

ANNEX B

Bond for importation of motor vehicles under section 591.5(g)

55 F.R 11375
March 28, 1990

Signed, sealed, and delivered in the presence of—

Name	Address	
Name	Address	_______________ (SEAL) (Principal)
Name	Address	
Name	Address	_______________ (SEAL) (Surety)

PREAMBLE TO AN AMENDMENT TO PART 591
Importation of Motor Vehicles and Equipment
(Docket No. 89-5; Notice 7)
RIN 2127-AD00

ACTION: Final rule; correction.

SUMMARY: On March 28, 1990, NHTSA published an amendment to the final rule on the importation of motor vehicles and equipment subject to the Federal motor vehicle safety standards, that added Federal bumper and theft prevention standards. NHTSA amended section 591.5(b) and section 591.5(h) in a manner inadvertently omitting language that had been added by a prior amendment on February 5, 1990. This notice restores the omissions.

DATE: The correction is effective April 25, 1990.

SUPPLEMENTARY INFORMATION: On February 5, 1990, NHTSA published a response to the petitions for reconsideration of 49 CFR Part 591 *Importation of Vehicles and Equipment Subject to the Federal Motor Vehicle Safety Standards* (Notice 4, 55 FR 3742). That notice amended section 591.5(b) to add the phrase "by the manufacturer" between the words "or" and "to the equipment item." The notice also amended section 591.5(h) in a way that the referent to the importer, "(s)he," appeared in the introductory text to the section, rather than in the subsections. However, a draft amendment to Part 591, eventually published on March 28, 1990 as Notice 6 (55 FR 11375), had been prepared prior to the preparation of Notice 4. Section 591.5(b) and Section 591.5(h) were not updated before the publication of Notice 6, with the result that a minor corrective amendment is required to reinsert the language added by Notice 4.

In consideration of the foregoing, Part 591 of 49 CFR is amended as follows:

1. In section 591.5(b), the phrase "by the manufacturer" is inserted between the words "or" and "to the equipment item."

2. In section 591.5(h), the introductory text is amended by adding "(s)he" after the word "because" and before the colon.

Issued on: April 19, 1990

Jeffrey R. Miller
Deputy Administrator

55 F.R. 17438
April 25, 1990

PART 591—IMPORTATION OF VEHICLES AND EQUIPMENT SUBJECT TO FEDERAL SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS

S591.1 Scope.

[This part establishes procedures governing the importation of motor vehicles and motor vehicle equipment subject to the Federal motor vehicle safety, bumper, and theft prevention standards. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990)]**

S591.2 Purpose.

[The purpose of this part is to ensure that motor vehicles and motor vehicle equipment permanently imported into the United States conform with theft prevention standards issued under Part 541 of this chapter and that they conform with, or are brought into conformity with, all applicable Federal motor vehicle safety standards issued under Part 571 of this chapter and bumper standards issued under Part 581 of this chapter. The purpose of this part is also to ensure that nonconforming vehicles and equipment items imported on a temporary basis are ultimately either exported or abandoned to the United States. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]**

S591.3 Applicability.

This part applies to any person offering a motor vehicle or item of motor vehicle equipment for importation into the United States.

S591.4 Definitions.

[All terms used in this part that are defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U S C 1391), and section 2 and section 601 of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 and 2021), are used as defined in the Acts, except that the term "model year" is used as defined in Part 593 of this chapter. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]]**

Administrator means the Administrator of NHTSA.

Dutiable value means entered value, as determined by the Secretary of the Treasury.

NHTSA means the National Highway Traffic Safety Administration of the Department of Transportation.

Original manufacturer means the entity responsible for the original manufacture or assembly of a motor vehicle, and does not include any person (other than such entity) who converts the motor vehicle after its manufacture to conformance with the Federal motor vehicle safety standards.

S591.5 Declarations required for importation.

No person shall import a motor vehicle or item of motor vehicle equipment into the United States unless, at the time it is offered for importation, its importer files a declaration, in duplicate, which declares one of the following:

[(a)(1) The vehicle was not manufactured primarily for use on the public roads and thus is not a motor vehicle subject to the Federal motor vehicle safety, bumper, and theft prevention standards, or

(2) The equipment item is not a system, part, or component of a motor vehicle and thus is not an item of motor vehicle equipment subject to the Federal motor vehicle safety, bumper, and theft prevention standards.

(b) The vehicle or equipment item conforms with all applicable safety standards (or the vehicle does not conform solely because readily attachable equipment items which will be attached to it before it is offered for sale to the first purchaser for purposes other than resale are not attached), and bumper and theft prevention standards, and bears a certification label or tag to that effect permanently affixed by the original manufacturer to the vehicle, or by the manufacturer to the equipment item or its delivery container, in accordance with, as applicable, Parts 541, 555, 567, 568, and 581, or 571 (for certain equipment items) of this chapter.

(c) The vehicle or equipment item does not comply with all applicable Federal motor vehicle safety, bumper, and theft prevention standards, but is intended solely for export, and the vehicle or equipment item, and the outside of the container of the equipment item, if any, bears a label or tag to that effect. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]**

(d) The vehicle does not conform with all applicable Federal motor vehicle safety, bumper, and theft prevention standards, but the importer is eligible to import it because:

(1) (S)he is a nonresident of the United States and the vehicle is registered in a country other than the United States,

(2) (S)he is temporarily importing the vehicle for personal use for a period not to exceed one year, and will not sell it during that time,

(3) (S)he will export it not later than the end of one year after entry, and

(4) The declaration contains the importer's passport number and country of issue.

(e) The vehicle or equipment item requires further manufacturing operations to perform its intended function, other than the addition of readily attachable equipment items such as mirrors, wipers, or tire and rim assemblies, or minor finishing operations such as painting, [and any part of such vehicle that is required to be marked by Part 541 of this chapter is marked in accordance with that Part. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]**

(f) [The vehicle or equipment does not conform with all applicable Federal motor vehicle safety standards (but does conform with all applicable federal theft prevention standards), but the importer is eligible to import it because:

(1) The importer has furnished a bond, which is attached to the declaration, in an amount equal to 150% of the dutiable value of the vehicle, containing the terms and conditions specified in section 591.8; and **(55 F.R. 11375—March 28, 1990. Effective—March 28, 1990)]**

(2)(A) The importer has registered with NHTSA pursuant to Part 592 of this chapter, and such registration has not been revoked or suspended, and the Administrator has determined pursuant to Part 593 of this chapter that the model and model year of the vehicle to be imported is eligible for importation into the United States, or

(B) The importer has executed a contract or other agreement with an importer who has registered with NHTSA pursuant to Part 592 of this chapter and whose registration has not been suspended or revoked, and the Administrator has determined pursuant to Part 593 of this chapter that the model and model year of the vehicle to be imported is eligible for importation into the United States;

(g) The vehicle does not conform with all applicable Federal motor vehicle safety and bumper standards (but it does conform with all applicable Federal theft prevention standards), but the importer is eligible to import it because:

(1) The importer's assigned place of employment has been outside the United States at all times between October 31, 1988, and the date the vehicle is entered into the United States;

(2) The importer has not previously imported a motor vehicle into the United States that was ubject to the Federal motor vehicle safety standards;

(3) The importer had acquired (or entered into a binding contract to acquire) the vehicle before October 31, 1988, and

(4) The vehicle will be entered into the United States not later than October 31, 1992.

[(5) The importer has furnished a bond, which is attached to the declaration, in an amount equal to 150% of the entered value of the vehicle as determined by the Secretary of the Treasury, containing the terms and conditions specified in section 591.8;

(6) The vehicle was not manufactured in conformity with all applicable safety and bumper standards, but it has been or will be brought into conformity; furthermore, within 120 days after entry or such additional time not to exceed 180 days after entry as the Administrator may allow, the importer will submit a true and complete statement to the Administrator, identifying the manufacturer, contractor, or other person who has brought the vehicle into conformity, describing the exact nature and extent of the work performed, and certifying that the vehicle or equipment item has been brought into conformity; and

(7) The importer will not sell the vehicle, or offer it for sale, until the Administrator issues a statement that the conditions of the bond required by section 591.6(c) have been satisfied. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]**

(h) [The vehicle does not conform with all applicable Federal motor vehicle safety, standards, and

bumper standards (but it does conform with all applicable Federal Theft prevention standards) but the importer is eligible to import it because (s)he:

(1)(i) Is a member of the personnel of a foreign government on assignment in the United States, or a member of the Secretariat of a public international organization so designated under the International Organization Immunities Act, and within the class of persons for whom free entry of motor vehicles has been authorized by the Department of State:

(ii) Is importing the motor vehicle on a temporary basis for the personal use of the importer, and will register it through the Office of Foreign Missions of the Department of State;

(iii) Will not sell the vehicle to any person in the United States, other than a person eligible to import a vehicle under this paragraph; and

(iv) Will obtain from the Office of Foreign Missions of the Department of State, before departing the United States at the conclusion of a tour of duty, an ownership title to the vehicle good for export only; or

(2)(i) Is a member of the armed forces of a foreign country on assignment in the United States;

(ii) Is importing the vehicle on a temporary basis, and for the personal use of the importer;

(iii) Will not sell the vehicle to any person in the United States, other than to a person eligible to import a vehicle under this subsection; and

(iv) Will export the vehicle upon departing the United States at the conclusion of a tour of duty. **F.R. 3742—February 5, 1990. Effective: February 5, 1990)]**

(i)(1) The vehicle was manufactured before January 1, 1968, or if a motorcycle, before January 1, 1969; or

(2) The equipment item was manufactured on a date when no applicable safety or theft prevention standards were in effect.

(j) The vehicle or equipment item does not conform with all applicable Federal motor vehicle safety, standards, but is being imported solely for the purpose of:

(1) research;

(2) investigations;

(3) studies;

(4) demonstrations or training; or

[(5) competitive racing events, and will not be licensed for use on the public roads. **(55 F.R. 3742—February 5, 1990. Effective: February 5, 1990)]**

S591.6 Documents accompanying declarations.

Declarations of eligibility for importation made pursuant to paragraph 591.5 must be accompanied by the following certification and documents, where applicable.

(a) A declaration made pursuant to paragraph 591.5(a) shall be accompanied by a statement substantiating that the vehicle was not manufactured for use on the public roads, or that the equipment item was not manufactured for use on a motor vehicle or is not an item of motor vehicle equipment.

(b) A declaration made pursuant to paragraph 591.5(e) shall be accompanied by:

(1) (For a motor vehicle) a document meeting the requirements of S568.4 of Part 568 of this chapter.

(2) (For an item of motor vehicle equipment) a written statement issued by the manufacturer of the equipment item which states the applicable Federal motor vehicle safety standard(s) with which the equipment item is not in compliance, and which describes the further manufacturing required for the equipment item to perform its intended function.

(c) [A declaration made pursuant to section 591.5(f) or section 591.5(g) shall be accompanied by a bond in the form shown in Annex A or Annex B of this Part, respectively, in an amount equal to 150% of the dutiable value of the vehicle for the conformance of the vehicle with all applicable Federal motor vehicle safety and bumper standards, or, if conformance with the safety standards is not achieved, for the delivery of such vehicle to the Secretary of the Treasury for export at no cost to the United States, or for its abandonment. **(55 F.R. 3742—February 5, 1990. Effective: February 5, 1990.)]**

(d) A declaration made pursuant to S591.5(f) by an importer who is not a Registered Importer shall be accompanied by a copy of the contract or other agreement that the importer has with a Registered Importer to bring the vehicle into conformance with all applicable Federal motor vehicle safety standards.

(e) A declaration made pursuant to S591.5(g) shall be accompanied by certification, including appropriate documentary proof that the vehicle for which declaration is made had been acquired by the importer as of October 31, 1988, or, if not so acquired, by a copy of a contract to acquire the vehicle dated before October 31, 1988, which was binding upon the importer.

(f) A declaration made pursuant to S591 5(h) shall be accompanied by a copy of the importer's official orders, or, if a qualifying member of the personnel of a foreign government on assignment in the United States, the name of the embassy to which the importer is accredited.

(g) A declaration made pursuant to S591.5(j) shall be accompanied by a full and complete statement identifying the specific purpose(s) of importation, describing the use to be made of the vehicle or equipment item, and stating the estimated period of time necessary to use the vehicle or equipment item on the public roads if any, and the disposition to be made of the vehicle or equipment item after completion of the purpose for which it was imported. If the importer does not intend to conform, export, or destroy the vehicle or equipment item not later than 3 years after its entry, the importer shall request permission in writing from the Administrator for the vehicle equipment item to remain in the United States for an additional period of time, subject to the limitations of S591.7(c).

S591.7 Restrictions on importations. [Deleted] (55 F.R. 6994—Effective: February 28, 1990.)

[S591.8 Conformance bond and conditions.

(a) The bond required under section 591.6(c) for importation of a vehicle not originally manufactured to conform with all applicable standards issued under Part 571 and Part 581 of this chapter shall cover only one motor vehicle, and shall be in an amount equal to 150% of the dutiable value of the vehicle.

(b) The principal on the bond shall be the importer of the vehicle.

(c) The surety on the bond shall possess a certificate of authority to underwrite Federal bonds. (See list of certificated sureties at 54 FR 27800. June 30, 1989)

(d) In consideration of the release from the custody of the U.S. Customs Service or the withdrawn from a Customs bonded warehouse into the commerce of, or for consumption in, the United States, of a motor vehicle not originally manufactured to conform to all applicable standards issued under Part 571 and Part 581 of this chapter, the obligors (principal and surety) shall agree to the following conditions of the bond:

(i) To have such vehicle brought into conformity with all applicable standards issued under Part 571 and Part 581 of this chapter within 120 days after the date of entry.

(ii)(1) In the case of a vehicle imported pursuant to section 591.5(f), to file (or if not a Registered Importer, to cause the Registered Importer of the vehicle to file) with the Administrator, a certificate that the vehicle complies with each Federal motor vehicle safety and bumper standard in the year that the vehicle was manufactured and which applies in such year to the vehicle; or

(2) In the case of a vehicle imported pursuant to section 591.5(g), to submit a true and complete statement to the Administrator, identifying the manufacturer, contractor, or other person who has brought the vehicle into conformity, describing the exact nature and extent of the work performed, and certifying that the vehicle has been brought into conformity with each Federal motor vehicle safety and bumper standard in the year that such vehicle was manufactured and which applies in such year to the vehicle.

(iii) In the case of a Registered Importer, not to release custody of the vehicle to any person for license or registration for use on public roads, streets, or highways, or license or register the vehicle from the date of entry until 30 calendar days after it has certified compliance of the vehicle to the Administrator, unless the Administrator has notified the principal before 30 calendar days that (s)he has accepted such certification, and that the vehicle and bond may be released, except that the vehicle shall not be released if the principal has received written notice from the Administrator that an inspection of the vehicle will be required, or that there is reason to believe that such certification is false or contains a misrepresentation; (iv) In the case of a Registered Importer, to cause the vehicle to be available for inspection, if the principal has received written notice from the Administrator that an insnection is required.

(iv) In the case of a Registered Importer, to cause the vehicle to be available for inspection, if the principal has received written notice from the Administrator that an inspection is required.

(v) In the case of a Registered Importer, not to release the vehicle until the Administrator is satisfied with the certification and any modification thereof, if the principal has received written notice from the Administrator that there is reason to believe that the certificate is false or contains a misrepresentation.

(vi) If the principal has received written notice from the Administrator that the vehicle has been found not to comply with all applicable Federal motor vehicle safety standards, and written demand that the vehicle be abandoned to the United States, or delivered to the Secretary of the Treasury for export (at no cost to the United States), to abandon the vehicle to the United States, or to deliver the vehicle, or cause the vehicle to be delivered to, the

custody of the District of Director of Customs of the port of entry listed above, or to any other port of entry, and to execute all documents necessary for exportation of the vehicle from the United States, at no cost to the United States; or in default of abandonment or redelivery after proper notice by the Administrator to the principal, to pay to the Administrator the amount of the bond.

(e) If the principal defaults on the obligation of paragraph (d)(vi) of this section, to abandon the vehicle to the United States or to redeliver the vehicle to the custody of a District Director of Customs and to execute all documents necessary for its exportation. the obligors shall pay to the Administrator the amount of the bond given under the provisions of thi section. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]**

[S591.9 Petitions for remission or mitigation of forfeiture.

(a) After a bond has been forfeited, a principal and/or a surety may petition for remission of forfeiture. A principal and/or a surety may petition for mitigation of forfeiture only if the motor vehicle has been imported pursuant to section 591.5(g), or, if imported pursuant to section 591.5(f), only if the condition not met relates to the compliance of a passenger motor vehicle with Part 581 of this chapter.

(b) A petition for remission or mitigation shall:

(1) Be addressed to the Administrator, identified as either a petition for remission or for mitigation, submitted in triplicate, and signed by the principal and/or the surety.

(2) State the make, model, model year, and VIN of the vehicle involved, and contain the Customs Entry number under which the vehicle entered the United States.

(3) State the facts and circumstances relied on by the petitioner to justify remission or mitigation.

(4) Be filed within 30 days from the date of the mailing of the notice of forfeiture incurred.

(c) A false statement contained in a petition may subject the petitioner to prosecution under the provisions of 18 U.S.C. 1001.

(d) If the Administrator finds that all conditions of the bond have, in fact, been fulfilled, the forfeiture is remitted.

(e) A decision to mitigate a forfeiture upon condition that a stated amount is paid shall be effective for not more than 60 days from the date of notice to the petitioner of such decision. If payment of the stated amount is not made, or arrangements made for delayed or installment payment, the full claim of forfeiture shall be deemed applicable. The Administrator shall collect the claim, or, if unable to collect the claim within 120 days, shall refer the matter to the Department of Justice. **(55 F.R. 11375—March 28, 1990. Effective: March 28, 1990.)]**

55 F.R. 11375
March 28, 1990

Department of Transportation
National Highway Traffic Safety Administration

BOND TO ENSURE CONFORMANCE WITH MOTOR VEHICLE SAFETY AND BUMPER STANDARDS

(To redeliver vehicle. to produce documents, to perform conditions of release, such as to bring vehicle into conformance with all applicable Federal motor vehicle safety and bumper standards)

Know All Men by These Presents That ______________________________

____
Name of principal or surety; if a corporation, the State of incorporation,

of ____ as principal,
Street address or post office box number; city; state; ZIP code,

and ______________________________ of ______________________________ ,
Name; State of incorporation, if any, Address

and ______________________________ of ______________________________ ,
Name; State of incorporation, if any, Address

as sureties, are held and firmly bound unto the UNITED STATES OF AMERICA in the sum of

____ dollars ($ ______________),

which represents 150% of the entered value of the following described motor vehicle as determined by the U.S. Customs Service:

____
Model year, make, series, engine and chassis numbers,

for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns (jointly and severally), firmly by these presents

WITNESS our hands and seals this ___________ day of ___________ , 199___

WHEREAS, motor vehicles may be entered under the provisions of section 108 of the National Traffic and Motor Vehicle Safety Act, and section 106 of the Motor Vehicle Information and Cost Savings Act; and

WHEREAS, pursuant to 49 CFR Part 591, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, the above-bounden principal desires to import permanently the motor vehicle described above, which is a motor vehicle that was not originally manufactured to conform with the Federal motor vehicle safety and bumper standards; and

WHEREAS, pursuant to 49 CFR Part 592, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, as amended, the above-bounden principal has been granted the status of Registered Importer of motor vehicles not originally manufactured to conform with the Federal motor vehicle safety standards (or, if not a Registered Importer, has a contract with a Registered Importer covering the motor vehicle described above); and

WHEREAS, pursuant to 49 CFR Part 593, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, as amended, the Administrator of the National Highway Traffic Safety Administration has determined that the motor vehicle described above is eligible for importation into the United States; and

WHEREAS, the motor vehicle described above has been imported at the port of ________ ,

and entered at said port for consumption on entry No. __________ , dated __________ , 199___,

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT—

(1) The above-bounden principal (the "principal"), in consideration of the permanent admission into the United States of the motor vehicle described above (the "vehicle"), voluntarily undertakes and agrees to have such vehicle brought into conformity with all applicable Federal motor vehicle safety and bumper standards within a reasonable time after such importation, as specified by the Administrator of the National Highway Traffic Safety Administration (the "Administrator"),

(2) The principal shall then file, or if not a Registered Importer' shall then cause the Registered Importer of the vehicle to file, with the Administrator, a certificate that the vehicle complies with each Federal motor vehicle safety standard in the year that the vehicle was manufactured and which applies in such year to the vehicle, and that the vehicle complies with the Federal bumper standard (if applicable),

(3) The principal, if a Registered Importer, shall not release custody of the vehicle to any person for license or registration for use on public roads, streets, or highways, or license or register the vehicle from the date of entry until 30 calendar days after it has certified compliance of the vehicle to the Administrator, unless the Administrator notifies the principal before 30 calendar days that (s)he has accepted such certification and the vehicle and bond may be released, except that no such release shall be permitted, before or after the 30th calendar day, if the principal has received written notice from the Administrator that an inspection of such vehicle will be required, or that there is reason to believe that such certification is false or contains a misrepresentation.

(4) And if the principal has received written notice from the Administrator that an inspection is required, the principal shall cause the vehicle to be available for inspection, and the vehicle and bond shall be promptly released after completion of an inspection showing no failure to comply. However, if the inspection shows a failure to comply, the vehicle and bond shall not be released until such time as the failure to comply ceases to exist;

(5) And if the principal has received written notice from the Administrator that there is reason to believe that the certificate is false or contains a misrepresentation, the vehicle or bond shall not be released until the Administrator is satisfied with the certification and any modification thereof.,

(6) And if the principal has received written notice from the Administrator that the vehicle has been found not to comply with all applicable Federal motor vehicle safety and bumper standards, and written demand that the vehicle be abandoned to the United States, or delivered to the Secretary of the Treasury for export (at no cost to the United States), the principal shall abandon the vehicle to the United States, or shall deliver the vehicle, or cause the vehicle to be delivered to, the custody of the District Director of Customs of the port of entry listed above or any other port of entry, and shall execute all documents necessary for exportation of the vehicle from the United States, at no cost to the United States, or in default of abandonment or redelivery after proper notice by the Administrator to the principal, the principal shall pay to the Administrator the amount of this obligation;

Then this obligation shall be void; otherwise it shall remain in full force and effect.

Signed, sealed, and delivered in the presence of—

Name	Address		
Name	Address	(Principal)	(Seal)
Name	Address		
Name	Address	(Surety)	(Seal)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, ______________________________ certify that I am the ____________________ of the corporation named as principal in the within bond; that ____________________, who signed the bond on behalf of the principal, was then ____________________ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

__________________________ (Corporate Seal)

To be used when a power of attorney has been filed with NHTSA.
May be executed by secretary, assistant secretary, or other officer.

ANNEX A

Bond for importations of motor vehicles under section 591.5(f).

Department of Transportation
National Highway Safety Administration

BOND TO ENSURE CONFORMANCE WITH MOTOR VEHICLE SAFETY AND BUMPER STANDARDS

(To redeliver vehicle, to produce documents, to perform conditions of release, such as to bring vehicle into conformance with all applicable Federal motor vehicle safety and bumper standards)

Know All Men by These Presents That ______________________________

____
name of principal or surety, if a corporation the State of incorporation

of ______________________________, as principal,
street address or post office box number, city, state, ZIP code

and ______________________________ of ______________________________,
name State of incorporation of surety — address

and ______________________________ of ______________________________,
name State of incorporation of surety — address

as sureties, are held and firmly bound unto the *UNITED STATES OF AMERICA*

in the sum of ______________________________ dollars ($______________),

Which represents 150% of the entered value of the following decribed motor vehicle as determined by the U.S. Customs

Service: ______________________________
model year make, series engine and chassis numbers

for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns (jointly and serverally), firmly by these presents

WITNESS our hands and seals this ______________ day of ______________, 199___

WHEREAS, motor vehicles may be entered under provisions of section 108 of the National Traffic and Motor Vehicle Safety Act, and section 106 of the Motor Vehicle Information and Cost Savings Act; and

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DOT Form XXXX

WHEREAS, pursuant to 49 CFR Part 591, a regulation promulgated under the provisions of section 108, National Traffic and Motor Vehicle Safety Act of 1966, the above-bounden principal desires to import permanently the motor vehicle described above, which is a motor vehicle that was not originally manufactured to conform with the Federal motor vehicle safety and bumper standards; and

WHEREAS, pursuant to paragraph 591.5(g) of 49 CFR Part 591, a regulation promulgated under the provisions of section 108, the above-bounden principal is eligible to import a motor vehicle under the provisions thereof: to wit, the above-bounden principal's assigned place of employment was outside the United States as of October 31, 1988, and (s)he has not had an assigned place of employment in the United States between that date and the date of entry of the motor vehicle described above, and (s)he has not previously imported a motor vehicle into the United States manufactured on or after January 1, 1968, and (s)he had acquired (or had entered into a binding contract to acquire) the motor vehicle described above not later than October 31, 1988, and (s)he will enter the motor vehicle described above not later than October 31, 1992; and

WHEREAS, the motor vehicle described above has been imported at the port of ______________, and entered at said port for consumption on entry No. ______________, dated ______________, 199___,

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT—

(1) The above-bounden principal (the "principal"), in consideration of the permanent admission into the United States of the motor vehicle described above (the "vehicle"), voluntarily undertakes and agrees to have such vehicle brought into conformity with all applicable Federal motor vehicle safety and bumper standards within 120 days after such importation, or such longer time not to exceed 180 days after such importation, as specified by the Administrator of the National Highway Traffic Safety Administration (the "Administrator");

(2) When the vehicle has been brought into conformity, the principal shall then file with the Administrator, a true and complete statement that the vehicle complies with each Federal motor vehicle safety standard in the year that the vehicle was manufactured and which applies in such year to the vehicle, and that the vehicle also complies with the Federal bumper standard;

(3) The principal shall not offer the vehicle for sale, or sell the vehicle, until the principal has received written notice from the Administrator that the principal has fulfilled all the conditions of the bond.

(4) And if the principal has received written notice from the Administrator that an inspection is required, the principal shall cause the vehicle to be available for inspection, and the vehicle and bond shall be promptly released after completion of an inspection showing no failure to comply. However, if the inspection shows a failure to comply, the vehicle and bond shall not be released until time as the failure to comply ceases to exist;

(5) And if the principal has received written notice from the Administrator that there is reason to believe that the statement is false or contains a misrepresentation, the vehicle or bond shall not be released until the Administrator is satisfied with the statement and any modification thereof;

(6) And if the principal has received written notice from the Administrator that the vehicle has been found not to comply with all applicable Federal motor vehicle safety and bumper standards, and written demand that the vehicle be abandoned to the United States, or delivered to the Secretary of the Treasury for export (at no cost to the United States), the principal shall abandon the vehicle to the United States, or shall deliver the vehicle, or cause the vehicle to be delivered to, the custody of the District Director of Customs of the port of entry listed above, or any other port of entry, and shall execute all documents necessary for exportation of the vehicle from the United States, at no cost to the United States; or in default of abandonment or redelivery after proper notice by the Administrator to the principal, the principal shall pay to the Administrator the amount of this obligation;

Name *Address*

Name *Address* *(Principal)* (SEAL)

Name *Address*

Name *Address* *(Surety)* (SEAL)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, ______________________________ certify that I am the ______________________________

of the corporation named as principal in the within bond; that ______________________________

______________________________, who signed the bond on behalf of the principal, was then

______________________________ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

______________________________ (CORPORATE SEAL)

To be used when a power of attorney has been filed with NHTSA
May be executed by secretary, assistant secretary, or other officer

ANNEX B

Bond for importation of motor vehicles under section 591.5(g)

55 F.R. 11375
March 28, 1990

PREAMBLE TO AN AMENDMENT TO PART 592

Registered Importers of Vehicles Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards

(Docket No. 89-6; Notice 4)
RIN 2127-AC97

AGENCY: National Highway Traffic Safety Adminisration (NHTSA), DOT.

ACTION: Technical Amendments; final.

EFFECTIVE DATE: The amendments are effective September 11, 1990.

SUMMARY: This notice contains technical amendments of the final rule published on September 29, 1989, which established requirements for the registration of importers of vehicles not originally manufactured to conform to the Federal motor vehicle safety standards. The amendments provide a more complete mailing address and a corrected FAX number.

SUPPLEMENTARY INFORMATION: On September 29, 1989, NHTSA published a notice that established 49 CFR Part 592, *Registered Importers of Vehicles Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards* (54 FR 40083).

In section 592.5(a)(1), the address to which applications for registration as importers should be sent was stated simply as "Washington, D.C. 20590, Attn: Importer Registration." In section 592.8(b), the address or FAX number to which registered importers must submit certifications of compliance was stated simply as "Washington, D.C. 20590, Attn: NEF-32, or be submitted electronically by FAX (202-366-2536)."

NHTSA wishes to add a more complete address as well as to provide a new FAX number. Therefore it is adding a room number and street address to the addresses previously given, and revising the referenced FAX number. Because the amendments are technical in nature and have no substantive impact, it it hereby found that notice and public comment thereon are unnecessary. Further, because the amendments are technical in nature, they are effective upon publication in the *Federal Register*.

In consideration of the foregoing part 592 of 49 CFR is amended as follows:

In section 592.5 (a)(1), the phrase "Washington, D.C., 20590 Attn: Importer Registration" is removed, and the phrase "Room 6115, 400 7th Street, S.W., Washington, D.C. 20590, Attn: NEF-32 Importer Registration" is inserted in its place.

In section 592.8(b), the phrase "Washington, D.C. 20590, Attn: NEF-32, or be submitted electronically by FAX (202-366-2536)" is removed and the phrase "Room 6115, 400 7th Street, S.W. Washington, D.C. 20590 Attn: NEF-32, or be submitted electronically by FAX (202-366-1024)" is inserted in its place.

Issued: September 1, 1990.

Jeffrey R. Miller
Deputy Administrator

55 F.R. 37329
September 11, 1990

PART 592—REGISTERED IMPORTERS OF VEHICLES NOT ORIGINALLY MANUFACTURED TO CONFORM TO THE FEDERAL MOTOR VEHICLE SAFETY STANDARDS

S592.1 Scope.

This part establishes procedures under section 108(c)(3)(D) of the National Traffic and Motor Vehicle Safety Act, as amended (15 U.S.C. 1397(c)(3)(D)), for the registration of importers of motor vehicles that were not originally manufactured to comply with all applicable Federal motor vehicle safety standards. This part also establishes the duties of Registered Importers.

S592.2 Purpose.

The purpose of this part is to provide content and format requirements for persons who wish to register with the Administrator as importers of motor vehicles not originally manufactured to conform to all applicable Federal motor vehicle safety standards, to provide procedures for the registration of importers and for the suspension, revocation and reinstatement of registration, and to set forth the duties required of Registered Importers.

S592.3 Applicability.

This part applies to any person who wishes to register with the Administrator as an importer of nonconforming vehicles, and to any person who is registered as an importer.

S592.4 Definitions.

All terms in this part that are defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used as defined therein.

"Administrator" means the Administrator, National Highway Traffic Safety Administration.

"NHTSA" means the National Highway Traffic Safety Administration.

"Registered Importer" means any person that the Administrator has registered as an importer pursuant to section 592.5(b).

S592.5 Requirements for Registration and its Maintenance.

(a) Any person wishing to register as an importer of motor vehicles not originally manufactured to conform to all applicable Federal motor vehicle safety standards must file an application which:

(1) Is headed with the words "Application for Registration as Importer", and submitted in three copies to: Administrator, National Highway Traffic Safety Administration, [Room 6115, 400 7th Street, S.W., Washington, D.C. 20590, Attn: NEF-32 Importer Registration. **(55 F.R. 37329—September 11, 1990. Effective: September 11, 1991.)**]

(2) Is written in the English language.

(3) Sets forth the full name, address, and title of the person preparing the application, and the name, address, and telephone number of the person for whom application is made.

(4) Sets forth, as applicable, the names of all owners, including shareholders, partners, or sole proprietors, of the person for whom application is made.

(5) If any of the owners listed in (4) above are corporations, sets forth the names of all shareholders of such corporation whose ownership interest is 10 percent or greater..

(6) Contains a statement that the applicant has never had a registration revoked pursuant to paragraph 592.7, nor is it or was it, directly or indirectly, owned or controlled by, or under common ownership or control with, a person who has had a registration revoked pursuant to paragraph 592.7.

(7) Contains a certified check payable to the Treasurer of the United States, for the amount of the initial annual fee established pursuant to Part 594 of this chapter.

(8) Contains a copy of a contract to acquire, effective upon its registration as an importer, a prepaid mandatory service insurance policy underwritten by an independent insurance company, or a copy of such policy, in an amount that equals

$2,000 for each motor vehicle for which the applicant will furnish a certificate of conformity to the Administrator, for the purpose of ensuring that the applicant will be able financially to remedy any noncompliance or safety-related defect determined to exist in any such motor vehicle in accordance with Part 573 and Part 577 of this chapter. If the application is accompanied by a copy of a contract to acquire such a policy, the applicant shall provide NHTSA with a copy of the policy within 10 days after it has been issued to the applicant.

(9) Sets forth in full data, views, and arguments of the applicant sufficient to establish that the applicant will be able, through a records system of acquiring and maintaining names and addresses of owners of vehicles for which it furnishes a certificate of conformity, and Vehicle Identification Numbers (VINs) of such vehicles, to notify such owners that a noncompliance or safety-related defect exists in such vehicles, and that it will be financially able to remedy a noncompliance or safety related defect through repurchase or replacement of such vehicles, or technically able through repair of such vehicles, in accordance with Part 573 and Part 577 of this chapter.

(10) Segregates and specifies any part of the information and data submitted under this part that the applicant wishes to have withheld from public disclosure in accordance with Part 512 of this chapter.

(11) Contains a statement that the applicant will fully comply with all duties of a registered importer as set forth in paragraph 592.6.

(12) Has the applicant's signature acknowledged by a notary public.

(b) If the information submitted is incomplete, the Administrator notifies the applicant of the areas of insufficiency, and that the application is in abeyance.

(c) If the Administrator deems it necessary for a determination upon the application, NHTSA conducts an inspection of the applicant. Subsequent to the inspection, NHTSA calculates the costs attributable to such inspection, and notifies the applicant in writing that such costs comprise a component of the initial annual fee and must be paid before a determination is made upon its application.

(d) When the application is complete (and, if applicable, when a sum representing the inspection component of the initial annual fee is paid), it is reviewed and a determination made whether the applicant should be granted the status of Registered Importer. Such determination may be based, in part, upon an inspection by NHTSA of the conformance, storage, and recordkeeping facilities of the applicant. If the Administrator determines that the application is acceptable, (s)he informs the applicant in writing that its application is approved and issues it a Registered Importer Number. If the information is not acceptable, the Administrator informs the applicant in writing that its application is not approved. No refund is made of those components of the initial annual fee representing the costs of processing the application, and conducting an inspection. Refund is made of that component of the initial annual fee representing the remaining costs of administration of the registration program.

(e) In order to maintain its registration, a Registered Importer shall provide an annual statement that affirms that all information provided under paragraphs (a)(4), (a)(5), (a)(6), (a)(9), and (a)(11) remains correct, and that includes a current copy of its insurance policy procured pursuant to paragraph (a)(8) of this section. "Such statement shall be titled Yearly Statement of Registered Importer", and shall be filed not later than October 31 of each year. A Registered Importer shall also pay such annual fee or fees as the Administrator may from time to time establish under Part 594 of this chapter. An annual fee shall be paid not later than October 31 of any calendar year, and shall be the annual fee for the fiscal year that began on October 1 of that calendar year. Any other fee shall be payable not later than 30 calendar days after the date that the Administrator has notified the Registered Importer of it in writing.

(f) A Registered Importer shall notify the Administrator in writing of any change that occurs in the information which is submitted in its application, not later than the end of the 30th calendar day after such change.

(g) A registration granted under this part is not transferable.

592.6 Duties of a Registered Importer.

Each Registered Importer shall:

(a) With respect to each motor vehicle that it imports into the United States, furnish to the Secretary of the Treasury (acting on behalf of the Administrator) [a bond in an amount equal to 150 percent of the entered value of the vehicle, as determined by the Secretary of the Treasury,] to ensure that such vehicle either will be brought into conformity with all applicable Federal motor vehicle safety standards prescribed under Part 571 of this chapter within 120 calendar days after such importation, or will be exported (at no cost to the United States) by the importer or the Secretary of the Treasury, or abandoned to the United States.

[(b)] Establish, maintain, and retain for 8 years from the date of entry of any nonconforming vehicle for which it furnishes a certificate of conformity pursuant to paragraph (e) of this section, organized records, correspondence and other documents relating to the importation, modification, and substantiation of certification of conformity to the Administrator, including but not limited to:

(1) The declaration required by paragraph 591.5 of this chapter, and 19 CFR 12.80.

(2) All vehicle or equipment purchase or sales orders or agreements, conformance agreements with importers other than Registered Importers, and correspondence between the Registered Importer and the owner or purchaser of each vehicle for which it has furnished a certificate of conformity.

(3) The last known name and address of the owner or purchaser of each motor vehicle for which it has furnished a certificate of conformity, and the VIN number of such vehicle.

(4) Records, both photographic and documentary, reflecting the modifications made and submitted to the Administrator pursuant to paragraph (e) of this section.

[(c)] Records, both photographic and documentary, sufficient to substantiate each subsequent certificate furnished to the Administrator for a vehicle of the same model and model year for which documentation has been furnished NHTSA in support of the initial certificate.

[(d)] Permanently affix to each motor vehicle, upon completion of modifications, a label that meets the requirements of paragraph 567.4 of this chapter, which identifies the Registered Importer, and provide to the Administrator a photocopy of the label attesting that such vehicle has been brought into conformity with all applicable Federal motor vehicle safety and bumper standards.

[(e)] Certify to the Administrator, upon completion of modifications, that the vehicle has been brought into conformity with all applicable Federal motor vehicle safety and bumper standards, and that it is the person legally responsible for bringing the vehicle into conformity.

[(f)] In substantiation of the initial certification provided for a specific model and model year, submit to the Administrator photographic and documentary evidence of conformance with each applicable Federal motor vehicle safety and bumper standard, and with respect to subsequent certifications of such model and model year, such information, if any, as the Administrator may request.

[(g)] With respect to any motor vehicle for which it has furnished a certificate of conformity to the Administrator, provide notification and remedy according to Part 573 and Part 577 of this chapter upon any determination:

(1) That a vehicle to which it is substantially similar, as determined under Part 593 of this chapter, incorporates a safety-related defect or fails to conform with an applicable Federal motor vehicle safety standard. However, this obligation does not exist if the manufacturer of the vehicle or Registered Importer demonstrates to the Administrator that the defect or noncompliance is not present in such vehicle.

(2) That the vehicle incorporates a safety-related defect or fails to conform with an applicable Federal motor vehicle safety standard, without reference to whether such may exist in a vehicle to which it is substantially similar, or whether such exists because it was created by the original manufacturer or by the Registered Importer.

(i) The requirement of 15 U.S.C. 1414(a)(2)(B) that remedy shall be provided without charge shall not apply if the noncompliance or safety-related defect exists in a motor vehicle whose first sale after importation occurred more than 8 calendar years before notification respecting the failure to comply is furnished pursuant to Part 577 of this chapter, except that if a safety-related defect exists and is attributable to the original manufacturer and not the Registered Importer, the requirements of 15 U.S.C. 1414(a)(2)(B) shall not apply to a motor vehicle whose date of first purchase, if known, or, if not known, whose date of manufacture, as determined by the Administrator, is more than 8 years from the date on which notification is furnished pursuant to Part 577 of this chapter.

(ii) Notification furnished pursuant to this paragraph and Part 577 of this chapter shall include the statement that in the absence of the Registered Importer's facility being within 50 miles of the owner's mailing address for performance of repairs, such repairs may be performed at a specific facility designated by the Registered Importer within 50 miles, or, if no such facility is designated, anywhere, and shall also include an explanation how repair is to be accomplished without charge to the vehicle owner.

[(h)] In order to allow the Administrator to determine whether a Registered Importer is meeting its statutory responsibilities, admit representatives of NHTSA during operating hours, upon demand, and upon presentation of credentials, to copy documents, or to inspect, monitor, or photograph any of the following:

(1) Any facility where any vehicle, for which a Registered Importer has the responsibility of providing a certificate of conformity to applicable safety standards, is being modified, tested, or stored;

(2) Any facility where any record or other document relating to modification, testing, or storage of vehicles being conformed, is filed;

(3) Any part or aspect of activities relating to the modification, testing, and/or storage of vehicles by the Registered Importer;

(4) Any motor vehicle for which it has provided a certification of conformity to the Administrator, and which remains in its custody or under its control.

[(i)] Maintain in effect a prepaid mandatory service insurance policy underwritten by an independent insurance company as a guarantor of its performance under paragraph (f) of this section.

[(j)] With respect to any motor vehicle it has imported and for which it has furnished a performance bond, to deliver such vehicle to the Secretary of the Treasury for export, or to abandon it to the United States, upon demand by the Administrator if such vehicle has not been brought into conformity with all applicable Federal motor vehicle safety standards. **(54 F.R. 40083—November 9, 1989. Effective: November 9, 1990)**

S592.7 Revocation, Suspension and Reinstatement of Registration.

(a) If the Administrator has not received any fee assessed and owing by the end of the 30th calendar day after such fee is due and payable, a registration is automatically suspended at the beginning of the 31st calendar day, and the Registered Importer is immediately notified in writing of the suspension at the address contained in its most recent annual statement or amendment thereof.

(b) If the Administrator has reason to believe that a Registered Importer has knowingly filed a false or misleading certification and that its registration should be automatically suspended or revoked, (s)he notifies the Registered Importer in writing of the facts giving rise to such reason to believe, affording an opportunity to present data, views, and arguments, either in writing or in person, within 30 calendar days after receipt of the Administrator's letter, as to whether it has submitted false or misleading certification, and as to why the registration ought not to be revoked or suspended. The Administrator then makes a decision after the 30-day period on the basis of all information then available. If, after consideration of all the data available, the Administrator determines that the Registered Importer has knowingly filed a false or misleading certification, the registration is automatically suspended or revoked, and the Registered Importer notified in writing. Any suspension or revocation is effective as of the date of the Administrator's determination. The Administrator shall state the period of any suspension in the notice to the Registered Importer.

(c) The Administrator may suspend a registration if a Registered Importer fails to comply with any requirement set forth in 15 U.S.C. 1397(c)(3)(D), paragraph 592.5(c), or paragraph 592.6, or if s(he) denies an application filed under paragraph 592.5(d). The Administrator may revoke a registration after any failure to comply with any such requirement, or if (s)he denies an application filed under paragraph 592.5(d). If the Administrator has reason to believe that there has been such a failure to comply and that the Registered Importer's registration should be revoked or suspended, (s)he notifies the Registered Importer in writing, affording an opportunity to present data, views, and arguments, either in writing or in person, within 30 calendar days after receipt of the Administrator's letter, as to whether there has been a failure to comply and as to why the registration ought not to be revoked or suspended. The Administrator then makes a decision after the 30-day period on the basis of all information then available. If the Administrator determines that a registration should be revoked or suspended, (s)he notifies the Registered Importer in writing. A revocation is effective immediately. A suspension is effective beginning with a date specified in the written notification.

(d) A Registered Importer whose registration has been revoked or suspended may request reconsideration of the revocation or suspension if the request is supported by factual matter which was not available to the Administrator at the time the registration was suspended or revoked.

(e) If its registration has been revoked, a Registered Importer is ineligible to apply for

reregistration under this part. No refund is provided of any annual or other fees the Registered Importer has paid for the fiscal year in which its registration is revoked. If its registration has been suspended it may file an application for reinstatement of its registration.

(f) The Administrator shall reinstate a suspended registration if the cause that led to the suspension no longer exists, as determined by the Administrator, either upon the Administrator's motion, or upon the submission of further information or fees by the Registered Importer.

S592.8 Inspection; Release of Vehicle and Bond.

(a) With respect to any motor vehicle for which it is obligated to provide a certificate of conformity to the Administrator as required by paragraph 592.6(d), a Registered Importer shall not obtain licensing or registration of the motor vehicle for use on the public roads, or release custody of it for such licensing and registration, except in accordance with the provisions of this section.

(b) When conformance modifications to a motor vehicle have been completed, a Registered Importer shall submit the certification required by paragraph 592.6(d) to the Administrator. In certifying a vehicle that the Administrator has determined to be substantially similar to one that has been certified by its original manufacturer for sale in the United States, the Registered Importer may rely on any certification by the original manufacturer with respect to identical safety features if it also certifies that any modification that it undertook did not affect the compliance of such safety features. Each submission shall be mailed by certified mail, return receipt requested, or by private carriers such as Federal Express, to: Administrator, National Highway Traffic Safety Administration, [Room 6115, 400 7th Street, S.W., Washington, D.C. 20590, Attn: NEF-32, or be submitted electronically by FAX (202) 366-1024, or in person.] Each submission shall identify the location where the vehicle will be stored and is available for inspection, pending NHTSA action upon the submission. **(55 F.R. 37329—September 11, 1990. Effective: September 11, 1991.)**

(c) Before the end of the 30th calendar day after receipt of certification of a motor vehicle pursuant to paragraph 592.6(d), the Administrator may inform the Registered Importer in writing that an inspection of the vehicle is required to ascertain the veracity of the certification. Written notice includes a proposed inspection date, which is as soon as practicable. If inspection of the vehicle indicates that the vehicle has been properly certified, at the conclusion of the inspection the Registered Importer is provided an instrument of release. If inspection of the vehicle shows that the vehicle has not been properly certified, the Registered Importer shall either make the modifications necessary to substantiate its certification, and provide a new certification for the standard(s) in the manner provided for in paragraph (b) of this section, or deliver the vehicle to the Secretary of the Treasury for export, or abandon it to the United States. Before the end of the 30th calendar day after receipt of new certification, the Administrator may require a further inspection in accordance with the provisions of this subsection.

(d) The Administrator may by written notice request certification verification by the Registered Importer before the end of the 30th calendar day after the date the certification was received by the Administrator. If the basis for such request is that the certification is false or contains a misrepresentation, the Registered Importer shall be afforded an opportunity to present written data, views, and arguments as to why the certification is not false or misleading or does not contain a misrepresentation. The Administrator may require an inspection pursuant to paragraph (c). The motor vehicle and performance bond involved shall not be released unless the Administrator is satisfied with the certification.

(e) If a Registered Importer has received no written notice from the Administrator by the end of the 30th calendar day after it has furnished a certification to the Administrator, the Registered Importer may release from custody the vehicle that is covered by the certification, or have it licensed or registered for use on the public roads.

(f) If the Administrator accepts a certification without requiring an inspection, (s)he notifies the Registered Importer in writing, and provides a copy to the importer of record. Such notification shall be provided not later than the 25th calendar day after the Administrator has received such certification.

(g) Release of the performance bond shall constitute acceptance of certification or completion of inspection of the vehicle concerned, but shall not preclude a subsequent determination by the Administrator pursuant to Section 152 of the Act (15 U.S.C. 1451) that the vehicle fails to conform to any applicable Federal motor vehicle safety standard.

54 F.R. 40083
September 29, 1989

PREAMBLE TO AN AMENDMENT TO PART 593

Determinations That a Vehicle Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards is Eligible for Importation

(Docket No. LVM 89-01; Notice 3)
RIN 2127-AC98

ACTION: Technical Amendments, final rule.

EFFECTIVE DATE: The amendments are effective September 11, 1990.

SUMMARY: This notice contains technical amendments of the final rule published on September 29, 1989, which established requirements for determinations that a vehicle not originally manufactured to conform to the Federal motor vehicle safety standards is eligible for importation. The amendments provide a more complete mailing address and correct a section designation.

SUPPLEMENTARY INFORMATION: On September 29, 1989, NHTSA published a notice that established 49 CFR Part 593, *Determinations That a Vehicle Not Originally Manufactured to Conform to the Federal Motor Vehicle Safety Standards is Eligible for Importation.* (54 FR 40093).

In section 593.5(b)(2), the address to which petitions for eligibility determinations should be sent was stated (after the name of the agency) simply as "Washington, D.C. 20590, Attn: Import Eligibility Determination." NHTSA wishes to add a more complete address and therefore it is adding a room number and street address and an internal mailing route code (NEF-32) to the address in section 593.5(b)(2).

In addition. in section 593.7, subsection (e) is immediately followed by subsection (g). This is an error, and subsection (g) is redesignated subsection (f).

In consideration of the foregoing part 593 of 49 CFR is amended as follows:

In section 593.5(b)(2) the phrase "Washington, D.C. 20590, Attn: Import Eligibility Determinations" is removed, and the phrase "Room 6115, 400 7th Street, S.W., Washington, D.C. 20590. Attn: NEF-32 Import Eligibility Determinations"" is inserted in its place.

In section 593.7, subsection (g) is redesignated subsection(f).

Issued on September 5, 1990

55 F.R. 37330
September 11, 1990

PART 593—DETERMINATIONS THAT A VEHICLE NOT ORIGINALLY MANUFACTURED TO CONFORM TO THE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IS ELIGIBLE FOR IMPORTATION

S593.1 Scope.

This part establishes procedures under section 108(c) of the National Traffic and Motor Vehicle Safety Act, as amended (15 U.S.C. 1397(c)), for making determinations whether a vehicle that was not originally manufactured to conform with all applicable Federal motor vehicle safety standards, and is not otherwise eligible for importation under Part 591 of this chapter, may be imported into the United States because it can be modified to meet the Federal standards.

S593.2 Purpose.

The purpose of this part is to provide content and format requirements for any Registered Importer and manufacturer who wishes to petition the Administrator for a determination that a vehicle not originally manufactured to conform to all applicable Federal motor vehicle safety standards is eligible to be imported into the United States because it can be modified to meet the standards.

The purpose of this part is also to specify procedures under which the Administrator makes eligibility determinations pursuant to those petitions as well as eligibility determinations on the agency's initiative.

S593.3 Applicability.

This part applies to a motor vehicle that was not originally manufactured and certified by its original manufacturer to conform with all applicable Federal motor vehicle safety standards and that is offered for importation into the United States.

S593.4 Definitions.

All terms in this part that are defined in section 102 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1391) are used as defined therein.

"Administrator" means the Administrator of the National Highway Traffic Safety Administration.

"Model year" means the year used by a manufacturer to designate a discrete vehicle model irrespective of the calendar year in which the vehicle was actually produced, or the model year as designated by the vehicle's country of origin, or, if neither the manufacturer nor the country of origin has made such a designation, the calendar year that begins on September 1 and ends on August 31 of the next calendar year.

"NHTSA" means the National Highway Traffic Safety Administration.

"Registered Importer" means any person who has been granted registered importer status by the Administrator pursuant to paragraph 592.5(b) of this chapter, and whose registration has not been revoked.

S593.5 Petitions for Eligibility Determinations.

(a) A manufacturer or Registered Importer may petition the Administrator for a determination that a vehicle that does not comply with all applicable Federal motor vehicle safety standards is eligible for importation, either

(1) On the basis that the vehicle

(i) is substantially similar to a vehicle which was originally manufactured for importation into and sale in the United States and which bore a certification affixed by its manufacturer pursuant to Part 567 of this chapter, and

(ii) is capable of being readily modified to conform to all applicable Federal motor vehicle safety standards; or

(2) On the basis that the vehicle has safety features that comply with or are capable of being modified to comply with all applicable Federal motor vehicle safety standards.

(b) Each petition filed under this part must:

(1) Be written in the English language;

(2) be headed with the words "Petition for Import Eligibility Determination" and submitted in three copies to: Administrator, National Highway Traffic Safety Administration, [Room 6115, 400 7th Street, S.W., Washington, D.C. 20590, Attn: NEF-32 Import Eligibility Determinations **(55 F.R. 37330—September 11, 1990. Effective: September 11, 1990)**];

(3) state the full name and address of the petitioner.

(4) if the petitioner is a Registered Importer, include the Registered Importer Number assigned by NHTSA pursuant to Part 592 of this chapter;

(5) set forth the basis for the petition and the information required by paragraph 593.6(a) or (b), as appropriate;

(6) specify any part of the information and data submitted which petitioner requests be withheld from public disclosure in accordance with Part 512 of this chapter; and

(7) submit a certified check payable to the Treasurer of the United States, for the amount of the vehicle eligibility petition fee established pursuant to Part 594 of this chapter.

(c) The knowing and willful submission of false, fictitious or fraudulent information may subject the petitioner to the crimina penalties of 18 U.S.C. 1001.

S593.6 Basis for Petition.

(a) If the basis for the petition is that the vehicle is substantially similar to a vehicle which was originally manufactured for importation into and sale in the United States, and which was certified by its manufacturer pursuant to Part 567 of this chapter, and that it is capable of being readily modified to conform to all applicable Federal motor vehicle safety standards, the petitioner shall provide the following information:

(1) Identification of the original manufacturer, model, and model year of the vehicle for which a determination is sought.

(2) Identification of the original manufacturer, model, and model year of the vehicle which the petitioner believes to be substantially similar to that for which a determination is sought.

(3) Substantiation that the manufacturer of the vehicle identified by the petitioner under paragraph (a)(2) above originally manufactured it for importation into and sale in the United States, and affixed a label to it certifying that it complied with all applicable Federal motor vehicle safety standards.

(4) Data, views and arguments demonstrating that the vehicle identified by the petitioner under paragraph (a)(1) above is substantially similar to the vehicle identified by the petitioner under paragraph (a)(2) above.

(5) With respect to each Federal motor vehicle safety standard that applied to the vehicle identified by the petitioner under paragraph (a)(2) above, data, views, and arguments demonstrating that the vehicle identified by the petitioner under paragraph (a)(1) above either was originally manufactured to conform to such standard, or is capable of being readily modified to conform to such standard.

(b) If the basis of the petition is that the vehicle's safety features comply with or are capable of being modified to comply with all applicable Federal motor vehicle safety standards, the petitioner shall provide the following information:

(1) Identification of the model and model year of the vehicle for which a determination is sought.

(2) With respect to each Federal motor vehicle safety standard that would have applied to such vehicle had it been originally manufactured for importation into and sale in the United States, data, views, and arguments demonstrating that the vehicle has safety features that comply with or are capable of being modified to conform with such standard. The latter demonstration shall include a showing that after such modifications, the features will conform with such standard.

S593.7 Processing of Petitions.

(a) NHTSA will review each petition for sufficiency under paragraphs 593.5 and 593.6. If the petition does not contain all the information required by this part, NHTSA notifies the petitioner, pointing out the areas of insufficiency, and stating that the petition will not receive further consideration until the required information is provided. If the additional information is not provided within the time specified by NHTSA in its notification, NHTSA may dismiss the petition as incomplete, and so notify the petitioner. When the petition is complete, its processing continues.

(b) NHTSA publishes in the *Federal Register*, affording opportunity for comment, a notice of each petition containing the information required by this part.

(c) No public hearing, argument, or other formal proceeding is held on a petition filed under this part.

(d) If the Administrator is unable to determine that the vehicle in a petition submitted under paragraph 593.6(a) is one that is substantially similar, or (if it is substantially similar) is capable of being readily modified to meet the standards, (s)he notifies the petitioner, and offers the petitioner the opportunity to supplement the petition by providing the information required for a petition submitted under paragraph 593.6(b).

(e) If the Administrator determines that the petition does not clearly demonstrate that the vehicle model is eligible for importation, (s)he denies it and notifies the petitioner in writing. (S)he also publishes in the *Federal Register* a notice of denial and the reasons for it. A notice of denial also states that the Administrator will not consider a new petition covering the model that is the subject of the denial until at least 3 months from the date of the notice of denial. There is no administrative reconsideration available for petition denials.

[(f)] If the Administrator determines that the petition clearly demonstrates that the vehicle model is eligible for importation, (s)he grants it and notifies the petitioner. (S)he also publishes in the *Federal Register* a notice of grant and the reasons for it.

S593.8 Determinations on the Agency's Initiative.

(a) The Administrator may make a determination of eligibility on his or her own initiative. The agency publishes in the *Federal Register*, affording opportunity for comment, a notice containing the information available to the agency (other than confidential information) relevant to the basis upon which eligibility may be determined.

(b) No public hearing, argument, or other formal proceeding is held upon a notice published under this section.

(c) The Administrator publishes a second notice in the *Federal Register* in which (s)he announces his or her determination whether the vehicle is eligible or ineligible for importation, and states the reasons for the determination. A notice of ineligibility also announces that no further determination for the same model of motor vehicle will be made for at least 3 months following the date of publication of the notice. There is no administrative reconsideration available for a decision of ineligibility.

S593.9 Effect of Affirmative Determinations; Lists.

(a) A notice of grant is sufficient authority for the importation by persons other than the petitioner of any vehicle of the same model specified in the grant.

(b) The Administrator publishes annually in the *Federal Register* a list of determinations made under Sec. 593.7, and Sec. 593.8.

S593.10 Availability for Public Inspection.

(a) Except as specified in paragraph (b) of this section, information relevant to a determination under this part, including a petition and supporting data, and the grant or denial of the petition or the making of a determination on the Administrator's initiative, is available for public inspection in the Docket Section, Room 5109, National Highway Traffic Safety Administration, 400 Seventh St., S.W., Washington, D.C. 20590. Copies of available information may be obtained, as provided in Part 7 of this chapter.

(b) Except for release of confidential information authorized under Part 512 of this chapter, information made available for inspection under paragraph (a) of this section does not include information for which confidentiality has been requested and granted in accordance with Part 512, and 5 U.S.C. 552(b). To the extent that a petition contains material relating to the methodology by which the petitioner intends to achieve conformance with a specific standard, the petitioner may request confidential treatment of such material on the grounds that it contains a trade secret or confidential information in accordance with Part 512 of this chapter.

54 F.R. 40093
September 29, 1989

PREAMBLE TO AN AMENDMENT TO PART 594

Schedule of Fees Authorized by the National Traffic and Motor Vehicle Safety Act

(Docket 89-8; Notice 4)
RIN 2127-AC98

ACTION: Final rule.

SUMMARY: In September 1989 NHTSA published its first schedule of fees authorized by the Imported Vehicle Safety Compliance Act of 1988, which amended the National Traffic and Motor Vehicle Safety Act of 1966. The 1988 Act provides that the fees shall be reviewed, and, if appropriate adjusted at least every two years. This final rule adopts certain adjustments which will apply as of October 1, 1990, the beginning of Fiscal Year 1991.

The agency has determined that the fee for the registration will remain unchanged at $255 for applications for registered importer status, and that the annual fee for renewal of such status will also be $255. The fee required to reimburse the U.S Customs Service for bond processing costs will increase by twenty cents to $4.55 per bond

Presently, the fee for a determination of vehicle eligibility for importation is payable by the registered importer who petitions the agency, or by the first person importing a vehicle under a determination made by the agency on its own initiative. These fees are $1,560 if the vehicle is substantially similar to a model certified by its original manufacturer as complying, and $2,150 if it is not. Under the new fee structure adopted, fees will be payable in part by any petitioner for a determination, and in part by the importer of each vehicle covered by a determination, with the agency reconciling costs and fees received in establishing appropriate fees for the next fiscal year. If the determination is made on NHTSA's initiative, the fee will be payable by the importer alone. The cost basis for the fees will remain the same but they will, in theory, be payable by all who benefit from such determinations. The agency has adopted a petition fee of $100 for substantially similar determinations, and $500 for others. Each vehicle imported under either determination will be subject to a fee of $83. Each vehicle imported under a determination made by NHTSA on its own initiative will be subject to a fee of $156.

DATE: The effective date of the final rule is September 30, 1990.

SUPPLEMENTARY INFORMATION

Introduction

On September 29, 1989, NHTSA adopted 49 CFR Part 594, establishing the initial fees authorized by section 108 of the National Traffic and Motor Vehicle Safety Act, as amended by the Imported Vehicle Safety Compliance Act of 1988, P.L. 100-562 (54 FR 40100; See this notice for a full description of the agency's methodology and rationale in its determination of costs). Section 108(c)(3)(B) (15 U.S.C. 108(c)(3)(B) of the Act provides that the amount or rate of fees shall be reviewed, and, if appropriate, adjusted at least every two years. Further, the fees applicable in any fiscal year shall be established before the beginning of such year. The statute authorizes an annual fee to cover the costs of administration of the importer registration program, an annual fee or fees to cover the costs of making import eligibility determinations, and an annual fee or fees to cover the costs of processing the bond furnished to the Customs Service. The purpose of this notice is to adopt appropriate fees for FY 1991, which begins October 1, 1990. A notice of proposed rulemaking on this subject was published on August 31, 1990 (55 FR 35694).

One comment was received on the proposal, from Liphardt & Associates, Inc; a registered importer. The comment was in general opposition to the Imported Vehicle Safety Compliance Act of 1988, and did not address the specific fees proposed in the August notice. Therefore, the agency is adopting all fees as proposed.

Requirements of the fee regulation.

594.6 Annual Fee for administration of the importer registration program.
Section 108(c)(3)(A)(iii) of the Vehicle Safety Act provides that registered importers must pay "such annual fee as the Secretary establishes to cover the cost of administering the registration program..." The annual fee attributable to the registration program is payable both by new applicants and by registered importers seeking to renew their registrations. The reader is referred to the notices of August 31, 1990, and September 29, 1989, for a fuller discussion of the fee and its components.

The initial component of the Registration Program Fee is the portion of the fee attributable to processing and acting upon registration applications. The agency estimates that this portion of the fee will be $86, and identical for both new applications and renewals.

Other costs attributable to maintenance of the registration program arise from reviewing a registrant's annual statement, and verifying the continuing validity of information already submitted. These costs also

include costs attributable to revocation or suspension of a registration.

The total portion attributable to maintenance of the registration program, as estimated by NHTSA, is approximately $169. When added to the $86 representing the registration application (or annual renewal) component, the cost per applicant or renewal equals $255. Therefore, NHTSA has determined that the annual registration fee, for the period October 1, 1990 through September 30, 1991, will be $255. In the event that an application is denied or withdrawn. NHTSA will refund all but $86 of this amount, or $169.

594.7, 594.8, Fees to cover agency costs in making importation eligibility determinations.

Section 108(c)(3)(A)(iii)(11) also requires Registered Importers to pay "such other annual fee or fees as the Secretary reasonably establishes to cover the cost of...making the determinations under this section." Pursuant to Part 593, these determinations are whether the vehicle sought to be imported is substantially similar to a motor vehicle originally manufactured for importation into and sale in the United States, and certified as meeting the Federal standards, and whether it is capable of being readily modified to meet those standards, or, alternatively, where there is no substantially similar U.S. motor vehicle, whether the safety features of the vehicle comply with or are capable of being modified to comply with the U.S. standards. These determinations are made pursuant to petitions submitted by Registered Importers or manufacturers, or pursuant to determinations made upon the Administrator's initiative. The reader is also referred to the August 31, 1990, and September 29, 1989, notices for a fuller discussion of the cost factors of such determinations.

The agency estimated the total direct and indirect costs for a determination involving a substantially similar vehicle at $1558.68, and for a non-similar vehicle at $2151.61. In this light, a fee of $1560 for substantially similar vehicle determinations, and one of $2150 for those that are not substantially similar, appeared to fulfill the statutory directive, and was adopted for FY 1990.

Costs appeared similar for those determinations made upon the agency's own initiative, and the same fee was adopted for recovery of costs. The principal issue here was how such costs were to be recovered in the absence of a petitioner. The method adopted was that it be paid by the first Registered Importer who furnished a certificate of conformity covering such vehicle after NHTSA's determination on its own initiative.

In actuality, the determination process during FY 1990 worked in a different manner than NHTSA contemplated. Applications for registration as importers were not submitted as quickly as expected, with the result that no importer had been registered by the effective date of the 1988 amendments, January 31, 1990, and no petitions filed. Once the initial Registered Importers had been appointed, NHTSA became aware of their reluctance to file determination petitions because of the petition fee. Sensing that an unintended burden on international commerce might result as a consequence, the agency proceeded to propose determinations on its own initiative with respect to vehicles that it believed were properly categorized as "substantially similar." However, the requirement that the entire fee be payable by the first person importing a vehicle under such a determination also was viewed by registered importers as inequitable, and a requirement that would cause hardship. In the comments on the agency's tentative determination, recommendations were made that the fee be split equally among all registered importers, or among the first five or ten vehicles imported under that determination. NHTSA met with registered importers and other interested persons on June 28, 1990, and the matter was discussed in further detail. The registered importers asked NHTSA if it could not impose a flat fee upon each vehicle imported which, like the bond processing fee, would be payable at the time the registered importer submitted certification for the vehicle.

As NHTSA commented in the proposal of August 31, 1990, it is interested in accommodating this view. The imposition of a flat fee per vehicle has the regulatory virtue of simplicity; it is easily understood by the regulated parties and it is easily administered by the agency. The difficult part comes in reconciling the sums realized with actual agency expenses. If the agency estimates that registered importers will conform 200 vehicles in 1991 that are covered by eligibility determinations made in FY91, and that a fee of $100 is appropriate for each, the agency may receive $20,000 in fees. That sum equals the cost of 13 determinations of substantial similarity at the FY90 fee level. Alternatively, this approach would represent two determinations of eligibility for non-similar vehicles. The problem is that, although the agency can estimate its costs per determination, it cannot estimate in advance with any degree of accuracy how many determinations it will have to make in the coming fiscal year, nor the basis on which the determinations would be made.

The agency reviewed the fee provisions of the 1988 Act, and found no requirement that it recover its costs in the fiscal year in which they are incurred, or that it be payable by any specific person in any specific manner. NHTSA believed that this flexibility and the provision of the Act which allows it to adjust fees on a yearly basis afforded it a mechanism by which fees can

be adjusted to compensate for NHTSA's actual expenses. For example, if the fees received in one fiscal year exceed NHTSA's costs, the overage can in effect be applied to the following year and be considered in determining the fee to be paid for the next fiscal year. Similarly, if NHTSA underestimated its costs, the fee may be adjusted upward in the ensuing fiscal year. NHTSA's limited experience to date indicates that petitions, or determinations on the Administrator's initiative, may vary in issues and complexity, and are likely to consume more time than the agency initially estimated. In addition, the fairest way to recover costs of determinations made on the agency's initiative appears to be to place the burden directly upon the importers of all such vehicles.

Therefore, with respect to FY 1991, NHTSA proposed a restructuring of its fee schedule. The cost basis previously adopted remained at $1,560 for substantially similar determinations, and at $2,150 for others. However, under the restructuring, the fee for a vehicle imported under a determination made on the agency's initiative would not be payable by a Registered Importer, but be payable by the importer of any vehicle covered by any determination made on the agency's initiative. The fee for a vehicle imported under a determination pursuant to a petition would be payable in part by the petitioner (who would still bear some of the cost burden, and not be excused totally from this requirement), and in part by importers. However, the fee to be charged for a vehicle would not be a pro rata share of the costs of the agency in making the eligibility determination for that type of vehicle, but a pro rata share of the costs in making all the eligibility determinations in the fiscal year, adjusted for previous shortfalls and overages.

NHTSA estimated that 610 vehicles may be imported in FY 1991 by registered importers, or persons having contracts with them. It further estimated that 400 of these vehicles may be imported pursuant to determinations of substantial similarity that would be made before October 1, 1990, and which would be subject to the fee structure in effect for FY 1990. The remaining 210 vehicles would be covered by determinations made in FY 1991. Of the 210 vehicles, the agency estimated that 30 would be covered by determinations made on its own initiative, and 180 pursuant to determinations made pursuant to petitions.

Of the determinations made pursuant to petitions. NHTSA estimated that 10 petitions would be filed, eight of which would cover substantially similar vehicles and two of them that would not. The estimated total cost of these determinations is $16,780 representing the sum of $12,480 (8 × $1,560) for determinations of substantial similarity, and $4,300 (2 × $2,150) for the remainder. The agency proposed a filing fee of $100 for substantial similarity petitions, and of $500 for those that are not. On this basis, the petitioners would bear $1,800 of the total costs (8 × $100 + 2 × $500). Subtracting $1.800 from the total costs leaves $14,980 to be borne by the importers of the 180 vehicles. Thus, NHTSA proposed that importers of vehicles covered by petition determinations pay a fee of $83.

The agency estimated that it may make three determinations of substantial similarity on its own initiative in the next fiscal year, and no determinations on the alternative basis. Thus the total costs to be recovered would be $4,680. As there would be no petitioner in such instances from whom a fee may be obtained, the agency proposed that importers bear the full burden of these costs. Assuming that 30 vehicles are imported that are covered by initiative determinations, the agency proposed that each vehicle be subject to a fee of $156. The $83 or $156 would be forwarded to NHTSA by the Registered Importer along with the bond processing fee and the certificate of compliance.

These fees have been adopted as proposed.

NHTSA will use a year of July 1—June 30 as the basis of its calculations for the next fiscal year. This is because of the necessity and time required to prepare and publish proposed fees, to allow a sufficient amount of time to comment upon them, and to prepare and issue a final rule not later than September 30.

594.9 Fee to recover the costs of processing the bond

Section 10B (c)(3)(A)(iii)(II) also requires a registered importer to pay "such annual fee or fees as the Secretary reasonably establishes to cover the cost of processing the bond furnished to the Secretary of the Treasury" upon the importation of a nonconforming vehicle to ensure that the vehicle will be brought into compliance within a reasonable time, or if the vehicle is not brought into compliance within such time, that it is exported without cost to the United States, or abandoned to the United States.

The statute contemplates that NHTSA make a reasonable determination of the cost to the United States Custom Service of processing the bond. For a fuller discussion of these costs, the reader is again referred to the notices of August 31, 1990, and September 29, 1989.

As of August 31, 1990, there had been no entries pursuant to this provision. Accordingly, NHTSA based its calculations on those previously submitted by Customs, adjusted to reflect salary increases. This would result in a slight increase in the present bond processing fee of $4.35 Therefore, NHTSA proposed and is adopting $4.55 as the bond processing fee for FY 1991. The rule also clarifies that the fee applicable to a particular vehicle is based upon the date of importation, not the date the certificate of conformity is furnished.

Effective Date

Pursuant to 5 USC 553(d)(3), a rule may be published less than 30 days before its effective date, for good cause found. Section 108(c)(3)(B) requires that the fee applicable in any fiscal year shall be established by NHTSA before the beginning of each such year. Therefore, NHTSA finds good cause for an effective date of September 30, 1990, which is earlier than 30 days after publication of the rule, so that the fees established by the rule will be applicable in Fiscal Year 1991, which begins October 1, 1990.

In consideration of the foregoing, 49 CFR Part 594 is amended as follows:

Section 594.3 is revised to read:

Section 594.3 Applicability.

This part applies to any person who applies to NHTSA to be granted the status of Registered Importer under part 592 of this chapter, to any person who has been granted such status, to any manufacturer not a Registered Importer who petitions the Administrator for a determination pursuant to part 593 of this chapter, and to any person who imports a motor vehicle into the United States pursuant to such determination.

3. Sections 594.5(c), (d), (e), and (g) are revised to read:

Section 594.5 Establishment and payment of fees.

* * * * *

(c) An applicant for status as Registered Importer shall submit an initial annual fee with the application. A Registered Importer shall pay an annual fee not later than October 31 of each year. The fee is that specified in section 594.6(i).

(d) A person who petitions the Administrator for a determination that a vehicle is eligible for importation shall file with the petition the fee specified in section 594.7(e).

(e) A person who imports a vehicle covered by a determination of the Administrator shall pay the fee specified in either section 594.B(b) or (c), as appropriate. Such fee shall be transmitted to the Administrator by the Registered Importer responsible for such vehicle at the time it furnishes a certificate of conformity pursuant to section 591.7(e) of this chapter.

* * * *

(g) No application or petition will be accepted for filing or processed before payment of the full amount specified. Except as provided in section 594.6(d), a fee shall be paid irrespective of NHTSA's disposition of the application, or of a withdrawal of an application.

Section 594.6 [Amended]

* * * *

4. In Section 594.6, paragraphs (a), (b), (d), (h) and (i), the dates "October 1, 1989" and "September 30, 1990" are revised respectively to read "October 1, 1990" and "September 30, 1991."

5. Section 594.7(e) is amended by revising paragraph (e) and adding paragraph (f) to read:

Section 594.7 Fee for filing petition for a determination whether a vehicle is eligible for importation.

* * * *

(e) For petitions filed from October 1, 1990 through September 30, 1991, the fee payable for a petition seeking a determination under paragraph (a)(1) above is $100. The fee payable for a petition seeking a determination under paragraph (a)(2) above is $500. If the petitioner requests an inspection of a vehicle, the sum of $550 shall be added to such fee. No portion of this fee is refundable if the petition is withdrawn or denied.

(f) In adopting a fee for the next fiscal year, the Administrator employs data based upon the cost of determinations and the amount of fees received for the 12-month period ending June 30 of the fiscal year preceding that fiscal year.

6. Section 594.8 is revised to read:

Section 594.8 Fee for importing a vehicle pursuant to a determination by the Administrator.

(a) A fee as specified in paragraphs (b) and (c) of this section shall be paid by each importer of a vehicle covered by a determination made under part 593 of this chapter to cover the direct and indirect costs incurred by NHTSA in making such determinations.

(b) If a determination has been made pursuant to a petition, the fee for each vehicle is $83. The direct and indirect costs that determine the fee are those set forth in sections 594.7(b), (c), and (d).

(c) If a determination has been made pursuant to the Administrator's initiative the fee is $156. The direct and indirect costs that determine the fee are those set forth in sections 594.7(b), (c) and (d), and references to "petition" shall be understood as relating to NHTSA's documents that serve as a basis for initiating determinations on its own initiative.

7. Section 594.9(c) is revised to read:

Section 594.9 Fee for reimbursement of bond processing costs.

(c) The bond processing fee for each vehicle imported from October 1, 1990, through September 30, 1991, for which a certificate of conformity is furnished, is $4.55.

Issued on September 28, 1990.

55 F.R. 40664
October 4, 1990

PART 594—SCHEDULE OF FEES AUTHORIZED BY THE NATIONAL TRAFFIC AND MOTOR VEHICLE SAFETY ACT

S594.1 Scope.

This part establishes the fees authorized by the National Traffic and Motor Vehicle Safety Act.

S594.2 Purpose.

The purpose of this part is to ensure that NHTSA is reimbursed for costs incurred in administering the importer registration program, in making determinations whether a nonconforming vehicle is eligible for importation into the United States, and in processing the bond furnished to the Secretary of the Treasury given to ensure that an imported vehicle not originally manufactured to conform to all applicable Federal motor vehicle safety standards is brought into compliance with the safety standards, or will be exported, or abandoned to the United States.

S594.3 Applicability.

[This part applies to any person who applies to NHTSA to be granted the status of a Registered Importer under Part 593 of this chapter, to any person who has been granted such status, to any manufacturers not Registered Importers who petition the Administrator for a determination pursuant to Part 593 of this chapter, and to any person who imports a motor vehicle into the United States pursuant to such determination. **(55 F.R. 40664— October 4, 1990. Effective: September 30, 1990)**]

S594.4 Definitions.

All terms used in this part that are defined in section 102 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1391) are used as defined in the Act.

"Administrator" means the Administrator of the National Highway Traffic Safety Administration.

"NHTSA" means the National Highway Traffic Safety Administration.

"Registered Importer" means any person who has been granted the status of registered importer under Part 592 of this chapter, and whose registration has not been revoked.

594.5 Establishment and Payment of Fees.

(a) The fees established by this part continue in effect until adjusted by the Administrator. The Administrator reviews the amount or rate of fees established under this part and, if appropriate, adjusts them by rule at least every 2 years.

(b) The fees applicable in any fiscal year are established before the beginning of such year. Each fee is calculated in accordance with this part, and is published in the *Federal Register* not later than September 30 of each year.

(c) [An applicant for status as Registered Importer shall submit an initial annual fee with the application. A Registered Importer shall pay an annual fee not later than October 31 of each year. The fee is that specified in section 594.6(i).

(d) A person who petitions the Administrator for a determination that a vehicle is eligible for importation shall file with the petition the fee specified in section 594.7(e).

(e) A person who imports a vehicle covered by a determination of the Administrator shall pay the fee specified in either section 594.8(b) or (c), as appropriate. Such fee shall be transmitted to the Administrator by the Registered Importer responsible for such vehicle at the time it furnishes a certificate of conformity pursuant to section 591.7(e) of this chapter. **(55 F.R. 40664—October 4, 1990. Effective: September 30, 1990)**]

(f) A fee for reimbursement for bond processing costs shall be filed with each certificate of conformity furnished the Administrator.

(g) [No application or petition will be accepted for filing or processed before payment of the full amount specified. Except as provided in section 594.6(d), a fee shall be paid irrespective of NHTSA's disposition of the application, or of a withdrawal of an application. **(55 F.R. 40664—October 4, 1990. Effective: September 30, 1990)**]

(h) Fee payments shall be by check, draft, money order, or Electronic Funds Transfer System made payable to the Treasurer of the United States.

S594.6 Annual Fee for Administration of the Registration Program.

(a) Each person filing an application to be granted the status of a Registered Importer pursuant to part 592 of this chapter during the period October 1, 1990, through September 30, 1991, shall pay an initial annual fee of $255, as calculated below, based upon the direct and indirect costs attributable to:

(1) processing and acting upon such application;

(2) any inspection deemed required for a determination upon such application;

(3) the estimated remaining activities of administering the registration program in the fiscal year in which such application is intended to become effective.

(b) That portion of the initial annual fee attributable to the processing of the application for applications filed from October 1, 1990, through September 30, 1991, is $86. The sum of $86, representing this portion, shall not be refundable if the application is denied or withdrawn.

(c) If, in order to make a determination upon an application, NHTSA must make an inspection of the applicant's facilities, NHTSA notifies the applicant in writing after the conclusion of any such inspection that a supplement to the initial annual fee in a stated amount is due upon receipt of such notice to recover the direct and indirect costs associated with such inspection and notification, and that no determination will be made upon the application until such sum is received. Such sum is not refundable if the application is denied or withdrawn.

(d) That portion of the initial annual fee attributable to the remaining activities of administering the registration program from October 1, 1990, through September 30, 1991, is set forth in subsection (i) of this section. This portion shall be refundable if the application is denied, or withdrawn before final action upon it.

(e) Each Registered Importer who wishes to maintain the status of Registered Importer shall pay a regular annual fee based upon the direct and indirect costs of administering the registration program, including the suspension and reinstatement, and revocation of such registration.

(f) The elements of administering the registration program that are included in the regular annual fee are:

(1) Calculating, revising, and publishing the fees to apply in the next fiscal year, including such coordination as may be required with the U.S. Customs Service.

(2) Processing and reviewing the annual statement attesting to the fact that no material change has occurred in the Registered Importer's status since filing its original application.

(3) Processing the annual fee.

(4) Processing and reviewing any amendments to an annual statement received in the course of a fiscal year.

(5) Verifying through inspection or otherwise that a Registered Importer is complying with the requirements of Sec. 592.6(b)(3) of this chapter for recordkeeping.

(6) Verifying through inspection or otherwise that a Registered Importer is able technically and financially to carry out its responsibilities pursuant to 15 U.S.C. 1411 *et seq.*

(7) Invoking procedures for suspension of registration and its reinstatement, and for revocation of registration pursuant to *Sec.* 592.7 of this chapter.

(g) The direct costs included in establishing the annual fee for maintaining Registered Importer status are the estimated costs of professional and clerical staff time, computer and computer operator time, and postage, per Registered Importer. The direct costs included in establishing the annual fee for a specific Registered Importer are costs of transportation and *per diem* attributable to inspections conducted with respect to that Registered Importer in administering the registration program, which have not been included in a previous annual fee.

(h) The indirect costs included in establishing the annual fee for maintaining Registered Importer status are a pro rata allocation of the average salary and benefits of persons employed in processing annual statements, or changes thereto, in recommending continuation of Registered Importer status, and a pro rata allocation of the costs attributable to maintaining the office space, and the computer or word processor. This cost is $6.71 per man-hour for the period October 1, 1990, through September 30, 1991.

(i) Based upon the elements, and indirect costs of paragraphs (f), (g), and (h) of this section, the component of the initial annual fee attributable to administration of the registration program, covering the period from October 1, 1989, through September 30, 1990, is $166.92. When added to the component representing the costs of registration of $85.99, as set forth in paragraph (b) of this section, the costs per applicant to be recovered through the annual fee

are $252.91. The annual registration fee for the period October 1, 1989, through September 30, 1990, is $255.

S594.7 Fee for Filing Petition for a Determination Whether a Vehicle is Eligible for Importation.

(a) Each manufacturer or registered importer who petitions NHTSA for a determination that—

(1) A nonconforming vehicle is substantially similar to a vehicle originally manufactured for importation into and sale in the United States and of the same model year as the model for which petition is made and is capable of being readily modified to conform to all applicable Federal motor vehicle safety standards, or

(2) a nonconforming vehicle which has safety features that comply with or are capable of being modified to comply with all applicable Federal motor vehicle safety standards, shall pay a fee based upon the direct and indirect costs of processing and acting upon such petition.

(b) The direct costs attributable to processing a petition filed pursuant to paragraph (a) of this section include the average cost per professional staff-hour, computer and computer operator time, and postage. The direct costs also include those attributable to any inspection of a vehicle requested by a petitioner in substantiation of its petition.

(c) The indirect costs attributable to processing and acting upon a petition filed pursuant to paragraph (a) of this section include a pro rata allocation of the average salary and benefits of persons employed in processing the petitions and recommending decisions on them, and a pro rata allocation of the costs attributable to maintaining the office space, and the computer or word processor.

(d) The direct costs attributable to acting upon a petition filed pursuant to paragraph (a) of this section, also include the cost of publishing a notice in the *Federal Register* seeking public comment, the cost of publishing a second notice with the agency's determination, and a pro rata share of the cost of publishing an annual list of nonconforming vehicles determined to be eligible for importation.

(e) [For petitions filed from October 1, 1990, through September 30, 1991, the fee payable for a petition seeking a determination under paragraph (a)(1) above is $100. The fee payable for a petition seeking a determination under paragraph (a)(2) above is $500. If the petitioner requests an inspection of a vehicle, the sum of $550 shall be added to such fee. No portion of this fee is refundable if the petition is withdrawn or denied. **(55 F.R. 40664—October 4, 1990. Effective: September 30, 1990)]**

[(f) In adopting a fee for the next fiscal year, the Administrator employs data based upon the cost of determinations and the amount of fees received for the 12-month period ending June 30 of the fiscal year preceding that fiscal year. **(55 F.R. 40664—October 4, 1990. Effective: September 30, 1990)]**

S594.8 Fee for Importing a Vehicle Pursuant to a Determination Made on the Administrator's Initiative.

(a) [A fee as specified in paragraphs (b) and (c) of this section shall be paid by each importer of a vehicle covered by a determination made under Part 593 of this chapter to cover the direct and indirect costs incurred by NHTSA in making such determinations.

(b) If a determination has been made pursuant to a petition, the fee for each vehicle is $83. The direct and indirect costs that determine the fee are those set forth in sections 594.7(b), (c), and (d).

(c) If a determination has been made pursuant to the Administrator's initiative the fee is $156. The direct and indirect costs that determine the fee are those set forth in sections 594.7(b), (c), and (d), and references to "petition" shall be understood as relating to NHTSA's documents that serve as a basis for initiating determinations on its own initiative. **(55 F.R. 40664—October 4, 1990. Effective: September 30, 1990)]**

(d) After NHTSA has made a determination on its own initiative, the notice published in the *Federal Register* announcing the determination includes a fee attributable to NHTSA's direct and indirect costs incurred pursuant to such determination, and an advisory that such fee shall be payable by the Registered Importer who furnishes a certificate of conformity pursuant to paragraph 592.6(a)(3)(vi) of this chapter, on behalf of the first person who files a declaration pursuant to paragraph 591.5(f) of this chapter that the vehicle is eligible for importation.

(e) After receipt of the first declaration covering a vehicle eligible for importation because of a determination made pursuant to the Administrator's initiative, NHTSA informs the appropriate Registered Importer that a fee in the stated amount shall accompany the certificate of conformity that the Registered Importer must furnish for the vehicle. No certificate shall be accepted for filing or processing unless and until such fee has been paid. A certificate for which no remittance is received may be returned to the Registered Importer.

S594.9 Fee for Reimbursement of Bond Processing Costs.

(a) Each registered importer shall pay a fee based upon the direct and indirect costs of processing each bond furnished to the Secretary of the Treasury with respect to each vehicle for which it furnishes a certificate of conformity to the Administrator pursuant to paragraph 591.7(e) of this chapter.

(b) The direct and indirect costs attributable to processing a bond are provided to NHTSA by the U.S. Customs Service.

(c) [The bond processing fee for each vehicle imported from October 1, 1990, through September 30, 1991, for which a certificate of conformity is furnished, is $4.55. **(55 F.R. 40664—October 4, 1990. Effective: September 30, 1990)**]

54 F.R. 40100
September 29, 1989

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US Department of Transportation

National Highway Traffic Safety Administration

Federal Motor Vehicle Safety Standards and Regulations

Supplement 45—Amendments and Interpretations Issued During 1991

Page Control Chart

(1) Part 533—Light Truck Average Fuel Economy Standards

(a) Insert attached pages numbered PART 533; PRE 153 through PRE 167-168 behind page in book numbered PART 533; PRE 151-152.

(b) Subsitute attached page numbered PART 533-1 for similarly numbered page in book.

(2) Federal Motor Vehicle Safety Standard No. 102

(a) Insert attached pages numbered PART 571; S102-PRE 7 through PRE 10 behind page in book numbered PART 571; S102-PRE 5-6.

(b) Substitute attached page numbered PART 571; Sl02—1-2 for similarly numbered page in book.

(3) Federal Motor Vehicle Safety Standard No. 108

(a) Insert attached pages numbered PART 571; S108-PRE 359 through PRE 380.

(b) Substitute attached Standard 108 for Standard 108 in book.

(4) Federal Motor Vehicle Safety Standard No. 114

(a) Insert attached pages numbered PART 571; S114-PRE 31 through PRE 36 behind page in book numbered PART 571; S114—PRE 30.

(b) Substitute attached page numbered PART 571 -1 for similarly numbered page in book.

(5) Federal Motor Vehicle Safety Standard No. 205

(a) Insert attached pages numbered PART 571; S205-PRE 37 through PRE 50 behind page in book numbered PART 571; S205-PRE 36.

(b) Substitute attached pages numbered PART 571; S205-1 through 4 for similarly numbered pages in book.

(6) Federal Motor Vehicle Safety Standard No. 210

(a) Insert attached pages numbered PART 571; S210-PRE 45 through PRE 68 behind page in book numbered PART 571; S210—PRE 43-44.

(b) Substitute attached pages numbered PART 571; S210-1 through 4 for similarly numbered pages in book.

(7) Federal Motor Vehicle Safety Standard No. 213

(a) Insert attached pages numbered PART 571; S213-PRE 67 through PRE 71-72 behind page in book numbered PART 571; S213-PRE 65-66.

(b) Substitute attached pages numbered PART 571; S213-11 through 15-16.

The Federal Motor Vehicle Safety Standards and amendments published in this format are for reference purposes only. They should not be considered as legally binding or be used as a source of authority in matters of litigation. *The United States Code of Federal Regulations* is the only source of legal authority for the standards.

PREAMBLE TO AN AMENDMENT TO PART 533

Light Truck Average Fuel Economy Standards
Model Years 1993-1994

(Docket No. FE-88-03; Notice 4)
RIN:2127-AD 56

ACTION: Final rule.

SUMMARY: This notice establishes the average fuel economy standards for light trucks manufactured in model years (MY) 1993 and 1994. Issuance of the standards is required by Title V of the Motor Vehicle Information and Cost Savings Act. For MY 1993, the combined standard for all light trucks manufactured by a manufacturer is 20.4 mpg, an increase of 0.2 mpg over the MY 1992 standard. For MY 1994, the combined standard is 20.5 mpg. The agency is not setting optional separate two-wheel drive and four-wheel drive standards.

DATES: The amendment is effective May 6, 1991. The standards apply to the 1993 and 1994 model years.

Table of Contents

I. Background

Issuance of light truck fuel economy standards is required by section 502(b) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C 2002(b)). That section requires the Secretary of Transportation to set light truck fuel economy standards at the maximum feasible average fuel economy level for each model year after 1978. In determining the maximum feasible average fuel economy level, the Secretary is required under section 502(e) of the Act to consider four factors: technological feasibility, economic practicability, the effect of other Federal motor vehicle standards on fuel economy, and the need of the nation to conserve energy. See 15 U.S.C. 2002(e). Responsibility for the automotive fuel economy program was delegated by the Secretary of Transportation to the Administrator of NHTSA (41 FR 25015, June 22, 1976). Prior to the MY 1992–94 rulemaking, the light truck standards set most recently by the agency had been 20.0 mpg for MY 1990 and 20.2 mpg for MY 1991. On January 6, 1989, NHTSA published in the *Federal Register* a Request for Comments seeking data on manufacturers' light truck fuel economy capabilities for model years (MY) 1992–94 (54 FR 436). All of the domestic light truck manufacturers responded, as did several foreign manufacturers.

After analyzing the responses to the Request for Comments and reviewing other available data, NHTSA published a notice of proposed rulemaking (NPRM) proposing ranges of standards for light truck average fuel economy standards for MY 1992–94 (55 FR 3608, February 2, 1990). For MY 1992, the proposed range was between 20.2 mpg and 21.0 mpg. For MY 1993, the proposed range was between 20.2 mpg and 21.5 mpg. The proposed range for MY 1994 was between 20.2 mpg and 22.0 mpg. These ranges were based on the agency's tentative evaluation of manufacturer capabilities. In a final rule published April 4, 1990 (55 FR 12487), NHTSA set the combined standard for MY 1992 at 20.2 mpg.

In prior light truck CAFE rulemakings, the agency had provided manufacturers with the option of dividing their light trucks into two fleets, a two-wheel drive (2WD) fleet and a four-wheel drive (4WD) fleet and meeting a separate standard for each fleet. However, as explained in the final rule for MY 1992, the agency decided to discontinue setting these separate alternative standards beginning with MY 1992.

In response to the February 2, 1990 NPRM, the agency received comments from General Motors, Ford, Chrysler, Nissan, the U.S. Department of Energy, the Natural Resources Defense Council, the Western

Interstate Energy Board, the Energy Conservation Coalition and the National Automobile Dealers Association. The issues raised by the commenters are discussed below.

II. Summary of Decision

Based on its analysis, the agency is establishing a combined average fuel economy standard for MY 1993 at 20.4 mpg, and a combined average fuel economy standard for MY 1994 at 20.5 mpg. Alternative separate standards for 2HD and 4HD light trucks are not being established.

III. Manufacturer Capabilities for Model Years 1993 and 1994

As part of its consideration of technological feasibility and economic practicability, the agency has evaluated manufacturers' fuel economy capabilities for MY 1993–94. In making this evaluation, the agency has analyzed manufacturers' current projections and underlying product plans and has considered what, if any, additional actions the manufacturers could take to improve their fuel economy. A more detailed discussion of these issues is contained in the agency's Final Regulatory Impact Analysis (FRIA), a public version of which has been placed in the docket for this rulemaking. There is also a nonpublic version which includes some information, including the details of manufacturers' future product plans, that has been determined by the agency to be confidential business information, release of which could cause competitive harm. The public version of the FRIA omits the confidential information.

A. Manufacturer Projections

General Motors: As discussed in the NPRM, General Motors (GM) projected in March 1989 that it could achieve a combined CAFE level of 20.7 mpg in MY 1993 and 20.8 mpg in MY 1994. In its March 1990 comments on the NPRM, GM repeated its projection of 20.7 mpg for MY 1993, while lowering its projection for MY 1994 to 20.7 mpg. GM attributes this slight decrease in its MY 1994 projection to adjustments to projected powertrain and model mixes, and to minor adjustments of estimated MY 1994 fuel economy for certain models.

The 20.7 mpg figure represents an improvement over the level of 19.7 mpg projected by GM for MY 1990 in a mid-model year report submitted in August 1990. The improvement projected by GM after MY 1990 is attributable to several factors, including increased penetration of certain engine technologies and aerodynamic improvements, a slight weight decrease and a shift toward more efficient models, for a net improvement by MY 1992 over MY 1990 of 1.0 mpg.

Although the CAFE impacts of these changes carry over into MY 1993–94, they are offset by volume adjustments, corrected projections on new models, a projected shift to heavier or less efficient options, and new weight estimates for safety and environmentally related hardware, for a net projected increase of zero. For MY 1994, GM's adjustments are essentially the same as for MY 1993.

However, in making its projections for MY 1993–94, GM noted that the actual level it achieved could be lower due to various uncertainties such as fuel prices, consumer demand for increased power and performance, new safety requirements and increasing competition in the light truck market. GM also stated that certain program risks (subject to a claim of confidentiality) could cause a decline in GM's projected MY 1993–94 CAFE to 20.4 mpg. GM recommended that the MY 1993–94 standards be set at or near the low end of the proposed range.

Ford: Ford projected in March 1989 that it could achieve CAFE levels of 20.6 mpg combined in MY 1993 and 20.4 mpg combined for MY 1994. By comparison, in a mid-model year report submitted in July 1990, Ford projected a MY 1990 combined light truck CAFE of 20.0 mpg. In its March 1990 comments on the NPRM, Ford raised its projections for MY 1993–94. At that time, Ford projected a CAFE of 20.9 mpg in MY 1993, and 20.8 mpg for MY 1994. These most recent projections were said to be subject to several risks, discussed below, which could result of achieving a lower level of CAFE.

In its comments on the NPRM, Ford projected a MY 1992 CAFE of 20.5 mpg. The 0.4 mpg net increase between MY 1992 and MY 1993 is due to several minor improvements and other fleet changes that result in a 0.5 mpg increase, and to product changes that result in a decrease of 0.1 mpg. For MY 1994, Ford projected that stricter emissions standards would decrease its CAFE by 0.4 mpg, but that this would be offset in part by minor improvements and a shift toward more efficient models, for a net decrease of 0.1 mpg, to 20.8 mpg for MY 1994. The projected CAFE figures do not include the risks and opportunities raised by Ford which are discussed in Section C, below.

In its response to the NPRM, Ford also emphasized the potential effect on CAFE of factors beyond its control, including unforeseen but normal technological shortfalls from the technological changes listed in its comments, the potential for increased import market share and concomitant loss of domestic share in the compact truck market segment, and the pending safety requirements for light trucks. In addition, Ford indicated that continued low fuel prices could further

increase the market demand for full-size light trucks, larger engines and increased optional equipment, causing a decline in its CAFE. Ford recommended that the light truck CAFE standard be set at 20.2 mpg in MY 1993 and no higher than 20.5 mpg for MY 1994.

Chrysler: Chrysler projected in March 1989 that it could achieve a CAFE level of 21.0 mpg in MY 1992, 20.9 mpg in MY 1993 and 20.8 mpg in MY 1994. By comparison, Chrysler's July 1990 mid-model year report for MY 1990 indicated a MY 1990 CAFE of 21.7 mpg. As noted in the final rule for MY 1992, the decline from MY 1990 to MY 1992 is a result of product changes and revised fuel economy estimates for certain models. In its February 1990 response to the NPRM, Chrysler projected its MY 1992 CAFE at 21.2 mpg, its MY 1993 CAFE at 20.9 mpg, and its MY 1994 CAFE at 21.4. These increases over the March 1989 projections are due to adjustments in Chrysler's fuel economy program, amounting to a 0.4 mpg increase each model year, offset by factors such as product introduction revisions and volume adjustments amounting to a 0.2 mpg decrease in MY 1992, and a 0.4 mpg decrease in MY 1993–94. However, the March 1990 projection for MY 1994 also includes a 0.6 mpg increase attributed to product changes which have since been cancelled.

In its response to the NPRM, Chrysler suggested that the CAFE standards for MY 1993–94 remain at the same level as MY 1991 (20.2 mpg), despite Chrysler's projections that it would exceed these levels by a considerable margin. Chrysler's view on the appropriate CAFE standards was based upon several uncertainties that underlie its fuel economy projections for these model years. These include the impact of revisions to the Clean Air Act, market shifts to larger trucks, and the price of gasoline. Chrysler also pointed to the U.S. economy as a factor which could negatively impact its CAFE if economic conditions worsen to the point that they necessitate the delay or postponement of certain plans.

Other Manufacturers

Volkswagen (VW) currently offers only one light truck model, the Vanagon compact bus. Volkswagen's combined light truck CAFE for MY 1990 is estimated at 20.8 mpg. VW indicated in its response to the January 1989 questionnaire that it has no significant improvements planned to increase fuel economy by MY 1993–94. The company's product plans are indefinite, but may involve a larger engine, or a front wheel drive model.

Range Rover projected its light truck CAFE for MY 1989 at 15.3 mpg in April 1989. At that time, the company did not expect any significant fuel economy improvement. However, the company has projected its 1990 and 1991 CAFEs at 16.3 mpg, 1.0 mpg higher than its MY 1989 projection.

Other foreign light truck manufacturers only compete in the small vehicle portion of the light truck market and are therefore expected to achieve CAFE levels well above those of GM and Ford, the manufacturers whose fuel economy capabilities determine the MY 1993–94 standards.

B. Possible Additional Actions to Improve MY 1993–94 CAFE

There are additional actions which the agency analyzed that could be implemented by manufacturers to improve their CAFEs above the levels which they currently project for MY 1993–94. These actions may be divided into three categories: further technological changes to their product plans, increased marketing efforts, and product restrictions or mix shifts.

1. Further Technological Changes

The ability to improve CAFE by further technological changes to product plans is dependent on the availability of fuel efficiency enhancing technologies which manufacturers are able to apply within the available leadtime.

The agency's FRIA discusses the fuel efficiency enhancing technologies which are expected to be available by MY 1993–4. NHTSA recognizes that the leadtime necessary to implement significant improvements in engines, transmissions, aerodynamics and rolling resistance is typically about three years. Also, as the agency discussed in establishing the final rule for MY 1990–91, once a new design is established and tested as feasible for production, the leadtime necessary to design, tool, and test components such as new body sheet-metal subsystems for mass production is typically 30 to 36 months. Other potential major changes may take longer. Leadtimes for new vehicles are usually at least three years.

Given leadtime constraints, the agency does not believe that manufacturers can achieve significant improvements in their projected MY 1993–94 CAFE levels by additional technological actions. Some improvements are, of course, possible due to slight increases in the extent of installation of more fuel efficient technology or changes in model mix. However, such changes are likely to be market driven, and are not likely to provide a substantial increase for any manufacturer.

2. Increased Marketing Efforts

As discussed in the NPRM, NHTSA believes that the ability to improve light truck CAFE by marketing efforts is relatively small. Light trucks are often purchased for their work-performing capabilities. This is particularly true for the larger, less fuel-efficient light trucks. Since the smaller light trucks cannot meet the needs of all light truck users, the manufacturers'

ability to use marketing efforts to encourage consumers to purchase smaller light trucks instead of larger light trucks is limited.

As a practical matter, marketing efforts to improve CAFE are largely limited to techniques which either make fuel-efficient vehicles less expensive or less fuel-efficient vehicles more expensive. Moreover, the ability of a manufacturer to increase sales of fuel-efficient light trucks depends in part on increasing its market share at the expense of competitors or pulling ahead its own sales from the future. The ability of domestic manufacturers to make such sales increases is also affected by the strong competition in that market from Japanese manufacturers. While the Japanese manufacturers currently have an overall combined market share of about 30 percent of light trucks, their share for the smaller, more fuel-efficient light trucks is about 45 percent.

A problem with pulling ahead sales is that the manufacturers' CAFE levels for subsequent years are reduced. For example, if a manufacturer improves its MY 1993 CAFE by pulling ahead sales of fuel-efficient light trucks from MY 1994, its MY 1994 CAFE will decrease, compared with the level it would have been in the absence of any pull-ahead sales attributable to marketing efforts. For this reason, a manufacturer cannot continually improve its CAFE simply by pulling ahead sales.

Given these considerations, NHTSA concludes that the domestic manufacturers cannot significantly improve their MY 1993-94 CAFE levels through increased marketing efforts.

3. Product and Possible Mix Shifts

As an alternative to technological improvements, manufacturers could improve their CAFE by restricting their product offerings (e.g., limiting or deleting production of particular larger light truck models and larger displacement engines). Such product restrictions could have adverse economic impacts on the industry and the economy as a whole.

The FRIA presents a scenario as an example in which GM, Ford, and Chrysler (since Chrysler's projected capability for MY 1993 is below the range of up to 21.5 mpg proposed in the NPRM for MY 1993) are assumed to restrict production of sufficient numbers of their least fuel-efficient light truck models to obtain a 0.5 mpg improvement in CAFE beyond their projected capabilities for MY 1993. Under this scenario, GM could suffer a sales loss of up to 175,000 light trucks for MY 1993, while Ford could experience a sales loss of more than 159,000 light trucks, and Chrysler a sales loss of more than 89,000 light trucks in MY 1993. The potential job losses under this scenario in manufacturing and supplier industries could total 28,000 to 85,000 for MY 1993.

These numbers are probably quite overstated, since, as GM has stated in past light truck rulemakings, and Ford has stated in its comments on this rule, product restrictions of the type envisioned above would likely be considered only after attempting marketing efforts and restricting the availability of particular engines and axle ratios. Ford and GM both submitted analyses of the sales and employment impact of setting the standard at 0.5 mpg beyond their respective capabilities. Both manufacturers' analyses show impacts much smaller than those projected above. However, the scenario is illustrative of the types of impacts that could result from standards that exceed manufacturers' true capabilities. In addition to the adverse impacts on the automotive industry, a wide range of businesses could be seriously affected to the extent that they could not obtain the light trucks they need for business use.

Although the current Mid-East crisis has, in the short run, somewhat tilted consumer demand toward smaller and more fuel efficient light trucks, it is unclear whether this shift can be maintained, since work-performing capability and load capacity are the primary factors that determine consumers' long-term choices when purchasing light trucks.

The U.S. Department of Energy (DOE) commented that NHTSA's method of analysis yields estimates of economic impacts that are so much larger than those that would actually occur, that it may not be meaningful to consider them. Although not advocating the payment of fines as an alternative to compliance, DOE suggested that the fines paid in such a circumstance would be a better context in which to evaluate the maximum negative impacts of a standard 0.5 mpg above the manufacturers' capability.

NHTSA's response to this comment is discussed in detail in the final rule for MY 1992. NHTSA does not dispute DOE's analysis for the case where manufacturers choose to pay penalties rather than comply with a standard beyond their capability. However, NHTSA's analysis focuses on the maximum impacts that would occur if manufacturers chose to comply with the standard through product restrictions, or were forced to so comply because marketing or other measures were unsuccessful. Moreover, the agency believes the statute directs it to consider the maximum fuel economy level that manufacturers can *achieve*, rather than the impact of penalties paid if the standards are not achieved.

Ford's comments expressed concern that establishing a CAFE standard beyond its capability could result in a substantial loss of sales, adverse employment effect, and economic hardship. The company is also concerned about the potential impact of product restrictions, and indicated that market research data show that the vehicles most likely to be restricted are used for a combination of commercial as well as personal uses.

In its comments, GM also expressed concern about the impact of product restrictions on consumer choice and industry employment.

NHTSA concludes based on these considerations that significant product restrictions should not be considered as part of manufacturers' capabilities to improve MY 1993–94 CAFE levels.

C. Manufacturer-Specific CAFE Capabilities

As discussed later in this notice, NHTSA is directed to take "industrywide considerations" into account in setting fuel economy standards. In carrying out this direction, the agency focuses on the least capable manufacturer with substantial shares of light truck sales. For MY 1993, the agency has determined that Ford is the least capable manufacturer with a substantial share of sales. For MY 1994, GM is the least capable manufacturer. During MY 1990, Ford had a 26 percent share of combined light truck sales. By comparison, GM had a 32 percent share, and Chrysler a 22 percent share. VW does not have a substantial share of industry sales. Its MY 1990 market share was 0.17 percent. Similarly, Range Rover's sales accounted for 0.13 percent of the light truck market in MY 1990.

GM, Ford, and Chrysler's MY 1993–94 CAFE projections are subject to a number of uncertainties which are discussed above. NHTSA has fully considered these uncertainties in determining manufacturer-specific capabilities.

Ford: As noted above, in March 1989, Ford projected a MY 1993 CAFE of 19.8 mpg, and a MY 1994 CAFE of 20.0 mpg. In its March 1990 comments, Ford projected a CAFE of 20.9 mpg for MY 1993, and 20.8 mpg for MY 1994, subject to risks and opportunities which Ford believes could lead to a decrease of about 0.5 mpg in MY 1993, and 0.7 mpg in MY 1994. Many of the technical risks and opportunities are each quite small. Ford believes that its fuel economy testing program may not yield the anticipated benefits, resulting in a 0.2 mpg decrease for both MY 1993 and MY 1994. This is offset, however, by minor technological improvements in both years which would raise Ford's CAFE by 0.2 mpg. Ford also anticipates that new safety requirements which become effective in MY 1993 and MY 1994 could decrease CAFE by 0.1 mpg in MY 1993 and 0.2 mpg in MY 1994 due to increased weight. Ford also includes a risk that planned fuel economy improvements may not achieve the projected levels, resulting in a 0.2 mpg decrease for both model years, and a 0.3 mpg decrease for both model years based on potential market risks. Finally, Ford's base projection includes a 0.4 mpg penalty in MY 1994 to account for more stringent emissions standards.

Ford concludes that these factors could result in adjusted CAFEs of 20.4 mpg for MY 1993 and 20.2 mpg for MY 1994. (The MY 1994 figure reflects a correction for a 0.1 mpg error in Ford's fleet description.) The agency agrees that Ford's fuel economy data vehicle testing program may not yield the entire benefit that Ford anticipates, and that Ford's baseline should be reduced by 0.2 mpg in both MY 1993 and MY 1994 to reflect this risk. NHTSA's analysis indicates that the minor technological improvements planned by Ford would be likely to result in a potential net gain of nearly 0.2 mpg in both model years. The agency also agrees with Ford's assessment of the CAFE penalties for new safety requirements in these model years. Further, NHTSA does not wish to discourage the voluntary installation of safety features such as automatic occupant restraints by disallowing Ford's projected penalty for increased safety features. NHTSA believes that Ford's assessment of potential market risks is overly pessimistic, and that all the events which comprise that risk are unlikely to occur simultaneously. Thus, NHTSA has added 0.1 mpg to Ford's capability for each year. In addition, the agency believes that certain technological improvements which Ford discounted from its baseline due to potential emissions penalties should be reinstated. This would amount to a negligible improvement for MY 1993, but would increase Ford's CAFE by 0.1 mpg in MY 1994. Finally, as discussed below in Section IV, the agency does not believe that the recent Clean Air Act amendments are likely to result in significant light truck fuel economy impacts. The agency notes that no other manufacturer claimed a specific emissions penalty in its MY 1994 CAFE projection. Moreover, the phase-in schedule in the Clean Air Act was delayed by one year from that in the draft legislation under consideration when Ford made its estimate. Thus, in its analysis and comparison with other manufacturers' projections, NHTSA has not included this 0.4 mpg MY 1994 penalty deducted by Ford.

Taking these factors into account, NHTSA believes that Ford is capable of a CAFE of 20.6 mpg in MY 1993 and 20.9 mpg in MY 1994.

General Motors: As noted above, in March 1989, GM projected a MY 1993 CAFE of 20.7 mpg, and a MY 1994 CAFE of 20.8. In its March 1990 comments on the NPRM, GM revised its projection to 20.7 mpg for both MY 1993 and 1994 due to minor technical and mix adjustments. However, GM also indicated several uncertainties that combined could lower its projection by as much as 0.4 mpg for each year, for an adjusted CAFE of 20.3 mpg for both years. These risks were tied primarily to mix shifts toward less efficient vehicles.

As with Ford's projection, NHTSA believes that GM's market risk estimate is likely overstated. For example, as noted in the MY 1992 final rule, GM's CAFE can be increased if GM would drop the low-volume

offering of the fuel-inefficient 7.4 litre C10 pickup. Taking this consideration into account when analyzing GM's market risk, the agency believes that a reasonable adjustment for GM's market risk during MY's 1993 and 1994 is 0.1 mpg for each year. This decrease is offset because NHTSA believes that GM omitted from its baseline certain technological improvements for which it projects increasing market share during MY 1993–94, and which could produce a CAFE improvement of about 0.1 mpg in both model years. NHTSA concludes that GM is capable of a CAFE for MY 1993 and 1994 of 20.7 mpg.

As discussed at length in the MY 1992 final rule, the U.S. Department of Energy (DOE) commented that the upper end of the CAFE ranges proposed in the NPRM were achievable and represented the maximum feasible level. DOE's analysis was based on a linear interpolation between a base CAFE for each domestic manufacturer for MY 1987 and DOE's analysis of the manufacturers' capabilities for MY 1995. This methodology assumes both that DOE's MY 1995 projection is actually achievable and that each manufacturer has the capability to improve each year by the same fixed amount (about 0.4 mpg per model year). NHTSA questions both assumptions. Based on the manufacturers' submissions, GM will improve about 1.0 mpg between MY 1990 and MY 1994, but a large part of this is due to an unfavorable model mix in MY 1990 due to a short model year for compact pickups and utility vehicles. Ford will improve by 0.6 mpg and Chrysler will *decline* by 0.3 mpg between MY's 1990 and 1994.

The agency does not believe that DOE's extrapolation of CAFE values is a meaningful method to determine individual manufacturer capabilities for specific years, nor is it as accurate as an examination of product plans in establishing short-term capabilities for individual manufacturers. As explained in the MY 1992 final rule, NHTSA has provided DOE with comments on the draft report on which the MY 1995 projection is based, and does not believe that all issues have been resolved between DOE and NHTSA.

IV. Effect of Other Federal Standards

In determining the maximum feasible fuel economy level, the agency must take into consideration the potential effects of other Federal standards. The following section discusses other government regulations, both in process and recently completed, that may have an impact on fuel economy capability for MY 1993-94.

1. Safety Standards

As discussed in the FRIA, NHTSA has evaluated several safety rulemakings for their potential impacts on light truck fuel economy in MY 1993-94. This final rule does not address the impact of regulations that take effect in MY 1992. The CAFE impact of those regulations and issues raised by commenters concerning those regulations were addressed in the final rule for MY 1992.

The safety regulations evaluated by the agency for this rulemaking which are anticipated to become effective during MY 1993–94 include revisions to FMVSS Nos. 208; *Occupant crash protection,* 108; *Lamps, reflective devices and associated equipment,* 214; *Side door strength,* and 216; *Roof crush resistance-passenger cars.* In addition, the agency has evaluated proposed revisions to 49 Part 523, addressing vehicle classification for safety standards.

FMVSS No. 208. The agency published an NPRM on January 9, 1990 (55 FR 747) proposing to require automatic restraints on light trucks with a GVWR of 8,500 pounds or less and an unloaded vehicle weight of 5,500 pounds or less. The proposal would phase in the requirements, so that each manufacturer would be required to equip 20 percent of its light trucks manufactured between September 1, 1993 and August 31, 1994 with automatic restraints. From September 1, 1994 through August 31, 1995, 50 percent of each manufacturer's light trucks would have to be so equipped, and from September 1, 1995 on, all light trucks would be required to have automatic restraints. Thus, this proposal would have no direct impact on MY 1993 light trucks, and would affect only 20 percent of MY 1994 light trucks.

NHTSA has estimated the range of potential weight impacts (including secondary weight) from this proposed requirement to be between 5–36 pounds. Assuming manufacturers made changes to maintain constant acceleration performance despite the weight increases, fuel economy would be reduced about 0.05–0.10 mpg. However, since the requirement would only affect 20 percent of the MY 1994 fleet, the negative CAFE effect would be only 0.01–0.02.

In its response to the NPRM, Ford indicated the addition of driver-only passive restraints would add 20 to 50 pounds per affected vehicle, and that the addition of a passenger airbag would add 25 pounds, not including structural support. GM projected in its comments that airbags would add 17 to 24 pounds per affected vehicle. Chrysler noted that it did not include the impact of automatic restraints in its CAFE projections. No other comments were received on the potential impacts of automatic restraints on light truck CAFE.

Although NHTSA has not yet issued a final rule requiring automatic restraints for light trucks, the agency has included the weight impacts outlined by the manufacturers in assessing MY 1993–94 fuel economy capabilities. Even if the agency decides not to require automatic restraints for light trucks in the proposed

time frames, it does not want this MY 1993–94 CAFE rulemaking to discourage the voluntary installation of these systems in light trucks.

FMVSS 214. On December 22, 1989, the agency published an NPRM (54 FR 52826), proposing to extend the existing requirements of Standard No. 214 to trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less, effective September 1, 1992.

NHTSA has estimated that the proposal, if adopted, could result in an average weight increase of 18–20 pounds per vehicle not including possible secondary weight, or 31-35 pounds including possible secondary weight. If the requirement takes effect as proposed, it could reduce MY 1993 and MY 1994 fuel economy levels by about 0.1 mpg.

Chrysler indicated in its comments that its projections included the effects of side door beams for MY 1993 and beyond. However, Chrysler did not provide a specific estimate of the fuel economy impacts of the proposed revisions to Standard No. 214. GM indicated that the side impact proposal would result in a 12–24 pound weight increase due to redesigned doors and glass. Ford stated that the proposal would result in a weight increase of 20–35 pounds per vehicle, depending on vehicle size and door configuration.

The weight impact estimates provided by the manufacturers are generally consistent with NHTSA's estimates. Since NHTSA has not altered the manufacturers' weight estimates, the potential impacts of this standard are included in the agency's fuel economy capability assessments.

FMVSS 108. Changes to the agency's lighting standard permit the use of smaller sealed beam headlamps, replaceable light source headlamps and lower mounting height. All of these changes should give manufacturers greater design freedom to achieve lower aerodynamic drag and some weight reductions, which could have positive impacts on CAFE. However, the agency does not have any data to estimate the reduction in drag that may be economically achievable for light trucks as a result of these changes. These positive effects may be counterbalanced by possible slow consumer acceptance of light truck styling for certain models which have been influenced by aerodynamic considerations. However, Ford indicated in its comments on the fuel economy NPRM that the changes to Standard 108 may permit more aerodynamic front end designs, and provide some opportunity for weight reduction.

On May 31, 1990, the agency published a NPRM (55 FR 22039) to require that new light trucks be equipped with Center High Mounted Stop Lamps (CHMSLs). The proposed effective date would be September 1, 1992, affecting MY 1993 and later light trucks. NHTSA estimates that this requirement would result in a weight increase of about one pound and that it would have a negligible impact on CAFE.

In its comments on the MY 1992–94 fuel economy NPRM, Ford estimated that CHMSLs would result in a two pound weight increase. This increase is included in Ford's fuel economy projections. GM did not mention FMVSS No. 108 in its response. Chrysler indicated that it has included CHMSLs in its projections, but it did not provide a specific estimate of the potential impact.

FMVSS 216. On November 2, 1989 (54 FR 46275), NHTSA published an NPRM proposing to extend the roof crush protection requirements of Standard No. 216 to light trucks and multipurpose passenger vehicles with GVWRs of 10,000 pounds or less, with a proposed effective date of September 1, 1991.

GM, Ford, and Chrysler all indicated in their comments that they had considered the fuel economy impacts of the proposal in their fuel economy projections. Since most light trucks already comply with the proposed requirements, and only modest weight increases are anticipated for those vehicles not meeting the proposal, the agency believes that this rulemaking will have a negligible impact on automakers' MY 1993–94 fuel economy capabilities.

Vehicle classification. NHTSA proposed to establish a new vehicle classification system for determining the applicability of the Federal Motor Vehicle Safety Standards on October 17, 1988 (53 FR 40463). The proposed rule would not affect the classification of vehicles for fuel economy standards. The agency is not proposing to alter the definitions of "passenger automobile" or "light truck" as they appear in 49 CFR Part 523. However, vehicles that are defined as light trucks for the purpose of fuel economy standards would be the type of vehicle most affected by the proposed classification changes. Vehicles classified as light trucks for fuel economy standards include many vehicles currently classified as trucks or MPVs for the purpose of safety standards. However, as the agency proposed to amend its safety regulations in such a way as to ensure that re-classification, by itself, causes no change in the applicability of safety standards, adoption of the proposed classification rule would have no impact on manufacturers' fuel economy capabilities for MY 1993–94.

2. Noise Standards

The agency is not aware of any plans on the part of EPA to promulgate noise regulations during the MY 1993–94 time period, and therefore does not anticipate any attendant fuel economy impacts.

3. Emission Standards

The Clean Air Act Amendments of 1990 impose new, more stringent emission standards on light trucks beginning in MY 1994. The amendments require that 40 percent of all light duty trucks up to 6,000 lbs GVWR meet more stringent standards for nonmethane hydrocarbons (NMHC), total hydrocarbons (HC), nitrogen oxides (NOx) and carbon monoxide (CO) in MY 1994. The remaining 60 percent of light duty trucks up to 6,000 lbs GVWR and those over 6,000 lbs GVWR would not be required to comply with the existing light duty standards until MY 1995 or 1996.

The Act includes new standards for CO emissions at low temperatures, with the requirements for light trucks beginning in MY 1994. The Act phases in CO requirements, requiring 40 percent of vehicles to comply in MY 1994. It also requires EPA to promulgate stricter evaporative HC emissions standards.

The revised Clean Air Act also requires light trucks to be equipped with onboard refueling vapor recovery systems. Such requirements must be effective in the fourth model year after the standards are promulgated, and EPA would be required to promulgate the standards within one year from enactment of the amendments. Thus, if the standards for onboard vapor recovery were issued during MY 1991, they would not take effect until MY 1995.

In their comments on the NPRM, manufacturers provided little definitive information on the CAFE impacts of the amendments since the future status of the amendments was unclear at that time. Chrysler indicated that it did "not know the task of meeting these standards, nor what effect there will be on fuel economy." GM assumed that stricter emissions standards could have a negative effect on fuel economy, and indicated that if the final Federal requirements were similar to the 1993 California standards, the fuel economy of each of its engines could be expected to decrease between 0 and 4½ percent. In addition, GM indicated that the more stringent HC standards could limit the application of some manual transmissions. Ford estimated that the proposed legislation would reduce its MY 1994 CAFE by 0.4 mpg, and included this penalty in its MY 1994 projection of 20.8 mpg. None of the other manufacturers included any emissions penalty in their CAFE projections.

EPA has indicated that, as a general rule, recent developments in emission control technology in the light duty fleet have allowed for decreases in emissions without losses in fuel economy. As an example, the use of computer controls to maintain the engine air-fuel ratio within a narrow range has made the use of three-way catalytic converters feasible. The use of these converters has in turn enabled manufacturers to optimize fuel economy while independently meeting emissions standards. Additionally, manufacturers are increasing the use of multipoint fuel injection on light trucks. This will provide a slight increase in fuel economy if it is not used to increase performance. EPA expects that the entire light truck fleet will be equipped with multipoint fuel injection by the mid-1990s.

The more stringent standards mandated by the Clean Air Amendments will likely be achieved by a combination of engine recalibration, catalyst reformulation, better air-fuel mixture control, and reformulated gasoline. Most of these changes will not affect fuel economy. Others are likely to provide some improvement in in-use fuel economy, and may provide some benefit during fuel economy testing for CAFE.

Although it appears that manufacturers can meet the emissions standards for the mid-1990s without suffering any significant fleet-wide fuel economy penalty, it is possible that there may be some initial, short-lived fuel economy losses. The limited emissions control engineering resources of the auto manufacturers must be utilized to meet stricter standards for both light trucks and passenger cars during these model years. Given the task of meeting more stringent standards on a wide variety of light truck powertrains, it is possible that some of the initial technologies and calibrations used to meet these standards may not be optimized. Consequently, some small loss of fuel economy is possible. Given the uncertainty in the development process, this effect cannot be precisely quantified. However, the agency has given consideration to these factors in setting the light truck CAFE standards in this final rule.

Diesel fuel quality. EPA published a final rule on August 21, 1990 (55 FR 34120) requiring a reduction in the permissible level of sulphur in diesel fuel, and a cap on aromatics at current levels for diesel fuel. The rule becomes effective October 1, 1993. The effect of this requirement will be to lower the particulate emissions from diesel engines operating on the fuel. By making it easier for diesel-powered vehicles to comply with emissions standards, this requirement potentially could improve the performance, and therefore marketability, of diesel-powered vehicles in the U.S., giving manufacturers an additional means to improve light truck CAFE.

Hydrocarbon emissions. On September 8, 1986, EPA published an advance notice of proposed rulemaking (ANPRM) concerning more stringent HC exhaust emissions for light-duty trucks. In December 1986, both GM and Ford commented that more stringent HC standards could have a negative impact on CAFE. This rulemaking has been superseded by the Clean Air legislation. Therefore, no potential impacts of this specific proposal were considered in determining the MY 1993–94 light truck CAFE standards.

Evaporative emissions. On January 19, 1990, EPA issued an NPRM proposing modifications to test procedures for control of evaporative emissions from running losses (55 FR 1914). This proposal would affect light duty vehicles fueled by gasoline or methanol, but it is expected to have no impact on fuel economy values as measured on the EPA test cycle. The Clean Air Act Amendments of 1990 require light trucks to be equipped with onboard vapor recovery systems in the fourth model year after standards are promulgated by EPA, in consultation with the Secretary of Transportation on the safety aspects of compliance. As mentioned above, NHTSA is not considering any impact of these systems on light truck fuel economy capabilities until MY 1995.

California air emissions standards. The California Air Resources Board (CARB) in 1986 adopted more stringent NOx standards for compact trucks sold in the state. The regulation phases in compliance, with 50 percent of light trucks weighing up to 3,750 pounds loaded vehicle weight subject to the standard in 1989, and 85 percent of vehicles in this class required to meet the standard for MY 1990–93. Beginning in MY 1994, all compact light trucks are subject to the standard. Both Ford and GM claimed in the MY 1990–91 rulemaking that this standard will have a small negative effect on their fuel economy capability. However, in that rulemaking, NHTSA concluded that by MY 1991, manufacturers should be able to eliminate or substantially reduce the projected penalty. California's standards for nonmethane hydrocarbons begin to become more stringent in MY 1993. In its response to the NPRM, GM indicated that the more stringent California HC standards scheduled to take effect in MY 1993 would result in a fuel economy loss from 0 to 1.5 percent depending on the characteristics of each engine. Ford also indicated that the Califonia standards would have a negative effect on fuel economy, although Ford did not distinguish between the impact of the California standards and the Federal Clean Air legislation in assessing that effect. As discussed above, NHTSA has considered the potential for reductions in light truck fuel economy capability due to new emissions requirements in setting the MY 1993–94 standards.

Chlorofluorocarbons. In response to the NPRM, GM indicated that manufacturers must develop substitutes for chlorofluorocarbons (CFCs) used in automotive air conditioning designs. Vermont has banned the registration of new vehicles using CFCs as a refrigerant beginning in MY 1993. GM indicated that replacing CFCs will result in a weight increase of around seven pounds per vehicle, and considerably more if sheet metal changes are necessary to accommodate new air conditioning systems. However, since NHTSA has not altered manufacturer's weight projections for this final rule, the potential impacts of this change are included in the agency's fuel economy capability assessments.

4. EPA Test Procedures

Gear shift indicator lights. During the MY 1990–91 fuel economy rulemaking, EPA issued a letter to manufacturers proposing to eliminate one of the two methods currently authorized to determine the fuel economy benefits of shift indicator lights. These dashboard lights are designed to inform drivers about the optimal speed, from a fuel economy standpoint, for shifting gears. EPA proposes to eliminate the driver usage rate survey, the method preferred by GM as a "more representative credit for actual shift indicator light usage than the on-road survey," and allow only an on-road shift light survey. At this point, EPA has not made a decision on this issue. No manufacturers raised the issue of shift indicator lights in their comments in response to NHTSA's request for comments on manufacturers' MY 1992–94 light truck fuel economy capabilities. In its comments on the MY 1992–94 fuel economy NPRM, GM stated that its light truck CAFE could be adversely affected if EPA were to eliminate the driver usage rate survey. However, since EPA has not made a decision on the issue, NHTSA has not made any adjustment to fuel economy capabilities to consider this factor.

5. Other Standards

Asbestos. On January 29, 1986, EPA proposed to prohibit the "manufacture, importation, and processing of asbestos in certain products," and the phasing out of asbestos in all other products. The implication of this rulemaking for motor vehicles would be to eliminate the use of asbestos in brake linings, clutch facings, automatic transmissions, and gaskets.

On July 12, 1989, EPA published a final rule (54 FR 29460) phasing in a prohibition of asbestos in almost all products. Asbestos brake linings are banned for use by original equipment manufacturers effective MY 1994. Asbestos clutch facings, automatic transmission components, and virtually all asbestos gaskets are banned as of August 25, 1993. In its comments on the MY 1990-91 light truck fuel economy rulemaking, GM indicated that the phase-out would increase vehicle weight approximately 5 pounds and reduce CAFE. However, GM provided no substantiation for its estimates. In response to NHTSA's request for comments on MY 1992–94 manufacturers' CAFE capabilities, no manufacturer indicated that this rule would have any potential impact on MY 1992 light truck fuel economy. However, in its comments on the fuel economy NPRM, GM indicated that while most necessary changes had been implemented, and therefore are included in the company's CAFE projections, certain changes had not yet been made. Specifically, the company anticipates

a 7-pound increase on the S/T models beginning in MY 1992. The effects are included in the agency's assessment of GM's fuel economy capability.

V. The Need of the Nation to Conserve Energy

The United States imported 15 percent of its oil needs in 1955. The import share had reached 35.8 percent by 1975, the year the Energy Policy and Conservation Act was passed, and peaked at 46.5 percent in 1977, at a cost of $62 billion (stated in 1982 dollars). While the import share of total petroleum supply declined after that year, the cost continued to rise to a 1980 peak of $87 billion (1982 dollars).

While the import share of petroleum supply declined through 1985, it has been increasing since that time. In 1985, the import share was 27.3 percent at a cost of $45 billion (1982 dollars). For 1988, net imports were 38.1 percent of total supply. For 1989, net imports were 41.6 percent of total supply. For January-August 1990, net imports reached 45.7 percent of total supply. Due to sharply lower petroleum prices, however, the value of imports declined from 1985 to 1989, from $45 billion to $39 billion (1989 dollars), but will undoubtedly be higher for 1990 because of the rapid increases in oil prices since the Iraqi invasion of Kuwait. Imports from OPEC also declined through 1985 but have been rising since that time. For the first 7 months of 1990, OPEC imports accounted for about 54 percent of total import supply, up from about 47 percent for 1989, and 51 percent for 1988.

The nation's dependence on petroleum net imports since 1975 is summarized in the following table:

Year	*Net Imports as Percent of U.S. Petroleum Products Supplied from*	
	OPEC	*All Countries*
1975 Average	22.0%	35.8%
1977 Average	33.6	46.5
* *	* *	*
1985 Average	11.6	27.3
1988 Average	20.3	38.1
1989 Average	23.8	41.6
1990 Average (First 6 mos.)	26.5	45.2

The current energy situation and emerging trends point to the continued importance of oil conservation. The United States now imports a higher percentage of its oil needs than it did during 1975, the year EPCA was passed, and the percentage of its oil supplied by OPEC is also somewhat higher than that of 1975. Oil continues to account for over 40 percent of U.S. energy use, and 97 percent of the energy consumed in the transportation sector. While the U.S. is the second-largest oil producer, it contains only 3-percent of the world's proved oil reserves. Moreover, proven reserves in the U.S. have declined from a peak of 39 billion barrels in 1970 to 27 billion barrels in 1988.

According to the Energy Information Administration's (EIA) 1990 Annual Energy Outlook, domestic production for its "base case" projection is expected to decline from 10.5 MMB/D in 1987 to 9.0 MMB/D in 1995, and 8.7 MMB/D in 2000. Net imports are projected to increase from 6.6 MMB/D in 1987 to 9.1 MMB/D in 1995 and 10.0 MMB/D in 2000. Thus, as a percentage of total U.S. petroleum use, EIA expects imports to rise to 50.3 percent of total supply in 1995 (exceeding the previous 1977 high of 46.4 percent) and 53.5 percent in 2000.

In its comment to the docket for NHTSA's 1990 passenger car CAFE rulemaking, the Department of Energy (DOE) emphasized several points about transportation's role in U.S. oil use and the importance of rising fuel efficiency. DOE noted that the 11 MMB/D used by the transportation sector in 1986 is almost 80 percent of total U.S. use of oil and over 90 percent of the critical light product use. Thus, DOE wanted NHTSA to consider the fact that any significant moderation in growing oil demand will require large transportation efficiency improvements. DOE also emphasized that the 1987 EIA oil demand forecasts assume that average new car efficiency will continue to improve, which DOE said does not seem likely given fuel economy trends (at least to the levels assumed by EIA), and that even with these projected increases in fuel efficiency, U.S. oil demand is projected to increase over 1.5 MMB/D by 2000.

The level of petroleum imports is only one aspect of the total energy conservation picture. Under EPCA and NEPA, for example, national security, energy independence, resource conservation, and environmental protection must all be considered. The importance of these issues is emphasized by the current conflict in the Persian Gulf, as well as by the prospect of the U.S.S.R. becoming an oil importer.

In March 1987, the Department of Energy submitted a report to the President entitled "Energy Security." NHTSA believes that the following quotation from that report represents a useful summary of the national security and energy independence aspects of the current energy situation:

> Although dependence on insecure oil supplies is . . . projected to grow, energy security depends in part on the ability of importing nations to respond to oil supply disruptions; and this is improving. The decontrol of oil prices in the United States, as well as similar moves in other countries, has made economies more adaptable to changing situations. Furthermore, the large

strategic oil reserves that have been established in the United States (and to a lesser extent, in other major oil-importing nations) will make it possible to respond far more effectively to any future disruptions than has been the case in the past.

The current world energy situation and the outlook for the future include both opportunities and risks. The oil price drop of 1986 showed how consumers can be helped by a more competitive oil market. If adequate supplies of oil and other energy resources continue to be available at reasonable prices, this will provide a boost to a world economy. At the same time, the projected increase in reliance on relatively few oil suppliers implies certain risks for the United States and the free world. These risks can be summarized as follows: If a small group of leading oil producers can dominate the world's energy markets, this could result in artificially high prices (or just sharp upward and downward price swings), which would necessitate difficult economic adjustments and cause hardships to all consumers.

Revolutions, regional wars, or aggression from outside powers could disrupt a large volume of oil supplies from the Persian Gulf, inflicting severe damage on the economies of the United States and allied nations. Oil price increases precipitated by the 1978–79 Iranian revolution contributed to the largest recession since the 1930's. Similar or larger events in the future could have far-reaching economic, geopolitical, or even military implications.

The continuing validity of the above quotation is verified by the recent events surrounding the Iraqi invasion of Kuwait in August 1990. Although there has been no noticeable oil supply disruption since the invasion, due in part to increased exports from other OPEC members to make up for the embargoed oil exports from Iraq and Kuwait, the market price of crude oil had an initial dramatic increase, and remains very unstable. This, coupled with the 5-cent per gallon increase in the Federal gasoline tax in December 1990, accentuates the need of the nation to conserve energy and the importance of improved vehicle fuel efficiency, both from an energy security and from an economic viewpoint.

The agency recognizes that the energy situation is affected in the near term by the current uncertainty about the outcome and length of time to resolve the situation in the Middle East. NHTSA believes it important to note that the fuel economy standards included in this final rule will not have near-term effects. They will not affect light truck fuel economy until the beginning of MY 1993, and then only gradually as these trucks replace older trucks. The long-term energy policy of the nation is being addressed by the National Energy Strategy (NES), which is being developed by the Department of Energy, with the cooperation of other government agencies, including the Department of Transportation.

This overall strategy will reflect careful examination of the need for energy conservation, and its impact on the components of the nation's economy, including the transportation sector. This examination includes overall transportation energy consumption, and not just increases in the fuel efficiency of the new vehicle fleet. Vehicle fleet turnover and vehicle miles of travel are critical determinants of energy consumption and must be considered in any analysis of policies affecting energy use by light duty vehicles. There are a number of conservation and energy efficiency measures being analyzed that will produce near-term energy savings that do not impose significant economic costs on the automotive industry or the public. The NES is due to be completed early this year.

With regard to this rulemaking, light truck registrations more than doubled between 1973 and 1989, and light truck sales are projected to increase 21 percent over the 1987–2000 period, compared to 14 percent for passenger cars. The light truck fleet's share of total oil consumption increased steadily from 6.4 percent in 1973 to 8.9 percent in 1980 to 12.1 percent in 1986 and to 12.5 percent in 1989. This increase in the light truck fleet's share of fuel consumption took place even as the average fuel economy of the on-road fleet of light trucks increased from an estimated 10.5 mpg in 1973 to 13.8 mpg in 1989. Clearly, light truck fuel economy will be an increasingly important determinant of the nation's level of petroleum consumption.

Information provided to NHTSA by the Department of Energy indicates that light trucks are used for a longer period of time (14.9 years versus 10.9 years) than passenger cars. Federal Highway Administration data indicate light trucks are driven farther annually (12,062 miles versus 10,382 miles) than passenger cars.

All of these factors result in the conclusion that improved light truck fuel economy contributes to the nation's efforts at conserving fuel. Light trucks meeting the standards proposed by this notice would be more fuel-efficient than the average vehicle in the current light truck fleet in service, thus making a positive contribution to petroleum conservation.

VI. Determining the Maximum Feasible Average Fuel Economy Level

As discussed above, section 502(b) requires that light truck fuel economy standards be set at the maximum feasible average fuel economy level. In making

this determination, the agency must consider the four factors of section 502(e): technological feasibility, economic practicability, the effect of other Federal motor vehicle standards on fuel economy, and the need of the nation to conserve energy. As with earlier CAFE rulemakings, NHTSA has considered and weighed all four statutory factors of section 502(e) in reaching its decision.

A. Interpretation of "Feasible"

Based on definitions and judicial interpretations of similar language in other statutes, the agency has in the past interpreted "feasible" to refer to whether something is capable of being done. The agency has thus concluded in the past that a standard set at the maximum feasible average fuel economy level must: (1) be capable of being done and (2) be at the highest level that is capable of being done, taking account of what manufacturers are able to do in light of technological feasibility, economic practicability, how other Federal motor vehicle standards affect average fuel economy, and the need of the nation to conserve energy.

B. Industrywide Considerations

The statute does not expressly state whether the concept of feasibility is to be determined on a manufacturer-by-manufacturer basis or on an industrywide basis. Legislative history may be used as an indication of Congressional intent in resolving ambiguities in statutory language. The agency believes that the below-quoted language provides guidance on the meaning of "maximum feasible average fuel economy level."

The Conference Report to the 1975 Act (S. Rep. No. 94-516, 94th Cong., 1st Sess. 154-5 (1975)) states:

> "Such determination [of maximum feasible average fuel economy level] should take industrywide considerations into account. For example, a determination of maximum feasible average fuel economy should not be keyed to the single manufacturer which might have the most difficulty achieving a given level of average fuel economy. Rather, the Secretary must weigh the benefits to the nation of a higher average fuel economy standard against the difficulties of individual manufacturers. Such difficulties, however, should be given appropriate weight in setting the standard in light of the small number of domestic manufacturers that currently exist, and the possible implications for the national economy and for reduced competition association (sic) with a severe strain on any manufacturer. . . ."

It is clear from the Conference Report that Congress did not intend that standards simply be set at the level of the least capable manufacturer. Rather, NHTSA must take industrywide considerations into account in determining the maximum feasible average fuel economy level.

NHTSA has consistently taken the position that it has a responsibility to set light truck standards at a level that can be achieved by manufacturers whose vehicles constitute a substantial share of the market. (See 49 FR 41251, October 22, 1984.) The agency did set the MY 1982 light truck fuel economy standards at a level which it recognized might be above the maximum feasible fuel economy capability of Chrysler, based on the conclusion that the energy benefits associated with the higher standard would outweigh the harm to Chrysler (45 FR 20871, 2086, March 31, 1989). However, as the agency noted in deciding not to set the MY 1983–85 light truck standards above Ford's level of capability, Chrysler had only 10–15 percent of the light truck domestic sales, while Ford had about 35 percent (45 FR 81593, 81599; December 11, 1980).

C. Petroleum Consumption

The precise magnitude of energy savings associated with alternative light truck fuel economy standards is uncertain. The FRIA provides calculations for the hypothetical lifetime fuel consumption of the MY 1993–94 domestic light truck fleets assuming those same fleets could and would achieve alternative CAFE levels. For example, the maximum difference in fuel consumption between the manufacturers' (GM, Chrysler, and Ford's) current capabilities for MY 1993 and a 21.0 mpg CAFE standard would be 395 million gallons over the lifetime of the model year's fleet.

However, it is possible that manufacturers may be able to achieve particular higher CAFE levels only by restricting the sales of their large light trucks. If this occurred, consumers might tend to keep their older, less-fuel efficient light trucks in service longer. Also, to the extent that a particular manufacturer might find it necessary to restrict sales of its large light trucks, consumers may be able to transfer their purchases of those same types of vehicles to another manufacturer which may have less difficulty meeting the CAFE standard. Thus, the agency believes that the actual impacts, if any, on energy consumption of alternative higher fuel economy standards, would be less than the theoretical calculations comparing levels of industrywide CAFE.

D. The MY 1993–94 Standards

Based on its analysis described above and on manufacturers' projections, the agency concludes that the major domestic manufacturers can achieve the combined fuel economy levels listed in the following table:

Manufacturer	Approximate market share	Combined CAFE	
	MY 1989	MY 1993	MY 1994
Chrysler	21.0%	20.9 mpg	20.8 mpg
GM	34.1%	20.7 mpg	20.7 mpg
Ford	26.1%	20.6 mpg	20.9 mpg

As indicated above, foreign manufacturers other than Volkswagen and Range Rover compete in only the small vehicle portion of the light truck market and are therefore expected to achieve CAFE levels well above those of GM, Ford, and Chrysler, which offer full ranges of light truck models.

As discussed in the MY 1992 final rule, beginning with MY 1992, NHTSA has decided not to promulgate separate 2WD and 4WD standards as an alternative to the combined standard.

The setting of maximum feasible fuel economy standards, based upon consideration of the four required factors, is not a mere mathematical exercise but requires agency judgment. Based on the preceding analysis and discussion, the agency concludes that Ford is the least capable manufacturer with a substantial share of sales for MY 1993, and that GM is the least capable manufacturer with a substantial share of sales for MY 1994. The agency has also concluded that 20.4 mpg is the maximum feasible combined standard for MY 1993, and 20.5 mpg is the maximum feasible combined standard for MY 1994.

As discussed above in Section IV, the Federal Clean Air legislation will result in more stringent vehicle emission standards. However, as stated by EPA, recent developments in emission control technology have allowed for decreases in emissions with no loss in fuel economy. The more stringent standards resulting from the legislation can probably be achieved by a combination of engine recalibration, catalyst reformulation, better air-fuel mixture control, and reformulated gasoline, without any resulting fleet-wide fuel economy penalty. Given the task of meeting more stringent standards on a wide variety of powertrains, it is possible that some of the technologies and calibrations may not be fully optimized in the first year or two of implementation. While this possible initial fuel economy loss cannot be precisely quantified, the agency has considered it and allowed some margin for its existence in setting the light truck CAFE standards for MY 1994.

NHTSA believes there are serious questions whether a standard set at a level above Ford's capability for MY 1993, or GM's capability for MY 1994 would be consistent with the requirement that standards be set taking industrywide considerations into account, given those companies' market shares.

Notwithstanding the projected product plans that the manufacturers have provided the agency and that are discussed above, there is the potential for some change in each manufacturer's CAFE. The above analysis has not covered the potential of mix shifts because of the possible adverse financial consequences to manufacturers and national employment of any large change in CAFE that is created by forced mix shifts. Nevertheless, the market may dictate changes in the light truck mix in response to fuel prices and availability. Low fuel prices and plentiful supply may result in an increased demand for power and performance, while a substantial increase in fuel prices could increase demand for more fuel-efficient models. The immediate marketplace reaction to the Iraqi invasion of Kuwait was for the sales proportion of light trucks to increase by about 4 percentage points in August and September 1990 over the July share.

The precise effects on petroleum conservation of a higher standard are uncertain. The maximum theoretical additional energy savings associated with a standard set at a higher level can be determined by comparing hypothetical situations where GM, Chrysler, and Ford would have combined average fuel economy levels of 21.0 mpg. Since most other manufacturers in the industry project MY 1993 CAFE above that of these manufacturers' capabilities, a standard set at 21.0 mpg would not be expected to affect the petroleum consumption of trucks manufactured by that part of the industry. The maximum difference in total gasoline consumption between these two hypothetical situations over the lifetime of the MY 1993 fleet would be 395 million gallons. The maximum yearly impact on U.S. gasoline consumption would be 46 million gallons, or roughly 300's of 1 percent of total transportation gasoline consumption.

The agency believes, however, that any gasoline savings associated with a higher standard would actually be less than indicated by this projection. While such a standard would provide added incentive for GM to achieve its maximum fuel economy capability, it is not clear in light of earning possible carryforward/carryback credits that they might not achieve this increase anyway. Ford and GM could not likely improve their CAFE levels other than by restricting sales of larger light trucks and engines. To the extent that would-be purchasers of such vehicles and engines transferred their purchases to Chrysler without that company otherwise changing its product plans, there could be little or no effect on overall petroleum consumption.

Higher standards than 20.4 mpg for MY 1993 and 20.5 mpg for MY 1994 could result in serious economic difficulties for Ford in MY 1993 or GM in MY 1994. Given leadtime constraints, NHTSA believes that the primary potential fuel-efficiency enhancing actions that Ford or any other manufacturer would consider in response to a higher standard would consist of marketing actions. For the reasons discussed earlier in this notice, however, the agency does not believe that marketing actions can be relied upon to significantly improve fuel economy. If such marketing actions were unsuccessful in whole or in part, the least capable manufacturer would likely have to engage in product restrictions, including limiting the sales of larger engines and/or vehicles to improve its fuel economy.

Such product restrictions could result in adverse economic consequences for that manufacturer, its employees and the economy as a whole and limit consumer choice, especially with regard to the load carrying needs of light truck purchasers.

Given Ford's 26 percent share and GM's 34 percent share of the light truck market in MY 1989, the capabilities of these manufacturers have a significant effect on the level of the industry's capability and, therefore, on the level of the standards. The agency believes that the 20.4 mpg standard for MY 1993 and the 20.5 mpg standard for MY 1994 balance the potentially serious adverse economic consequences associated with market and technological risks against potential fuel economy improvements. The agency concludes, in view of the statutory requirement to consider specified factors, that the relatively small and uncertain energy savings associated with setting a standard above Ford's capability for MY 1993 or above GM's capability for MY 1994 would not justify the potential economic harm to those companies and the economy as a whole.

As explained in the final rule for MY 1992, in addition to the comments discussed above, the agency received comments from Nissan, the Natural Resources Defense Council (NRDC), the Energy Conservation Coalition (ECC), the Western Interstate Energy Board (WINB), and the National Automobile Dealers Association (NADA).

The ECC, in comments endorsed by NRDC, argued that in setting the CAFE standards, NHTSA should double the 3 percent annual rate of increase provided by the high end of the proposed ranges. This would result in an MY 1992 CAFE of 22.2 mpg, and an MY 1994 CAFE of 25 mpg. The ECC also stated it is essential to set standards now for model years after 1994 to provide manufacturers with adequate leadtime to achieve higher fuel economy levels. The comments claimed these increases would be cost-effective, and listed a number of potential technological improvements available to manufacturers. Finally, ECC provided statistics on the potential fuel savings achievable through higher CAFE standards for light trucks, and emphasized the U.S. transportation sector's role as a source of greenhouse gas emissions.

ECC does not explain the basis for its suggested levels. The commenter did not demonstrate why these levels would be feasible. As explained above, the agency has determined that the maximum feasible levels for MY 1993-94 are 20.4 mpg and 20.5 mpg, respectively. NHTSA also notes that much of the technology listed in ECC's comments has already been extensively incorporated in the light truck fleet. The agency has included an analysis of carbon dioxide emissions associated with this CAFE standard in the Environmental Assessment prepared by the agency for this rulemaking and available from the Docket Section. Finally, the agency notes that the fuel economy levels and time frames for their implementation advocated by ECC exceed the scope of the NPRM.

NRDC, while endorsing the ECC comments, also expressed concern that the NPRM did not discuss NHTSA's decision to undertake a programmatic Environmental Impact Statement (EIS) to examine effects of the CAFE program. NRDC believes the agency's handling of fuel economy issues violates the National Environmental Policy Act, and that the agency has not adequately analyzed the relationship between fuel efficiency and carbon dioxide emissions. In response, NHTSA notes that it has provided an analysis of fuel economy and carbon dioxide emissions in its Environmental Assessment for this rulemaking, and is continuing its work toward the publication of a programmatic EIS for the CAFE program. To that end, the agency issued a notice of intent to prepare a programmatic EIS (54 FR 37702, September 12, 1989), and conducted a public scoping meeting on December 13, 1990.

WINB supports higher fuel economy standards than those proposed, although it does not provide specific levels. The comments note that the growing role of light duty trucks is a primary cause of the stagnation in the fleetwide CAFE of all light duty vehicles. WINB argues that the agency has not considered the economic implications of failing to increase light truck CAFE, and that domestic jobs will be lost as rising fuel prices shift demand toward more efficient, imported light trucks.

NHTSA believes that it has taken into account the economic implications of not setting higher standards. This issue is discussed in detail in the FRIA available from the Docket. The agency disagrees with WINB's assumption that significantly higher fuel prices are likely during the period affected by this rulemaking, and therefore disagrees that there will be a significantly increased demand for more fuel-efficient vehicles. See the FRIA for a more detailed discussion of future fuel prices. Despite the recent trend toward higher oil prices, the agency does not believe it can reliably assume that this trend will continue into the time frame addressed by this rulemaking. If the agency is wrong about energy prices and prices do increase, manufacturers will have a consumer-driven incentive to produce more fuel efficient light trucks. Such action would not introduce the economic risk inherent with manufacturer's attempts to shift the market through product restrictions or market incentives. This out-

come would benefit the nation in terms of energy conservation and reduce the manufacturers' risks in meeting the standards.

The agency also disagrees that domestic jobs will be lost as a result of its decision. In response to apparent consumer demands, import manufacturers are now introducing larger, more powerful, and less efficient light trucks. This trend gives no indication of reversing in the near future. Finally, the agency notes that promulgation of standards beyond the range proposed in the NPRM exceeds the scope of this rulemaking.

NADA recommended that the agency establish CAFE standards no higher than 20.2 mpg. This is the maximum feasible level in NADA's opinion, because of new regulatory constraints and the need to accommodate a wide range of consumer needs for utility and durability. NADA stated that NHTSA appears to have underestimated the potential impact of safety and emissions standards for MY 1992–94, although no specific data were provided.

NHTSA notes that emissions impacts stemming from the Clean Air Act amendments are discussed above, and were considered in setting the MY 1994 standards. The agency also believes that its analysis has adequately accounted for the CAFE impacts of safety requirements affecting the MY 1993–94 fleet.

In its comments, Nissan projected that it would be in compliance with the upper end of the ranges proposed in the NPRM, and was thus not opposed to their adoption.

In its March 1989 response to NHTSA's request for comments, Volkswagen suggested as an alternative to establishing a combined standard within its capability that the agency consider alternate special consideration for limited product line truck manufacturers. In establishing the MY 1980-81 light truck CAFE standards, the agency did establish a separate standard in light of International Harvester's (IH) limited product line. (See 43 FR 11995, March 23, 1978.) The agency noted that IH had unique problems given its limited sales volume, restricted product line, the fact that its engines were derivatives of medium duty truck (above 10,000 pounds GVWR) engines, and the fact that it did not have experience with state-of-the-art emission control technology which the other manufacturers had obtained in the passenger automobile market. The agency emphasized, however, that the separate class was being established for only two model years' duration, concluding that IH should be able to achieve levels of fuel efficiency in line with other manufacturers within that time period either through purchasing engines from outside sources or by making improvements to current engines.

The agency does not believe that Volkswagen's situation is similar to that of IH. While IH's difficulties were related to being newly subject to the fuel economy program, Volkswagen's potential CAFE difficulties are not. Under the Cost Savings Act, manufacturers are required to meet average fuel economy standards which are set based on industrywide considerations. For MY 1990, Volkswagen is projected to be well above the CAFE standard. Thus, NHTSA believes it is not appropriate to set a separate standard to accommodate Volkswagen's limited product line status.

533—[AMENDEDl

In consideration of the foregoing, 49 CFR Part 533 is amended as follows:

1. The authority citation for Part 533 continues to read as follows:

Authority: 49 U.S.C. 1657, 15 U.S.C. 2002; delegation of authority at 49 CFR 1.50.

2. Table III in § 533.5(a) is revised to read as follows:

§ 533.5 *Requirements.*

(a) * * *

TABLE III

Model Year	*Combined Standard* Captive Imports	*Combined Standard* Others
1992	*20.2*	*20.2*
1993	*20.4*	*20.4*
1994	*20.5*	*20.5*

Issued on March 29, 1991.

Jerry Ralph Curry
Administrator

56 F.R 13733
April 4, 1991

PART 533—LIGHT TRUCK FUEL ECONOMY STANDARDS
(Docket No. FE 77-05; Notice 5)

S533.1 Scope. This part establishes average fuel economy standards pursuant to section 502(b) of the Motor Vehicle Information and Cost Savings Act, as amended, for light trucks.

S533.2 Purpose. The purpose of this part is to increase the fuel economy of light trucks by establishing minimum levels of average fuel economy for those vehicles.

S533.3 Applicability. This part applies to manufacturers of light trucks.

S533.4 Definitions.

(a) *Statutory terms.*

(1) The terms "average fuel economy," "average fuel economy standard," "fuel economy," "import," "manufacture," "manufacturer," and "model year" are used as defined in section 501 of the Act.

(2) The term "automobile" is used as defined in section 501 of the Act and in accordance with the determinations in 49 CFR 523.

(3) The term "domestically manufactured" is used as defined in section 503(b) (2) (E) of the Act.

(b) *Other terms.* As used in this part, unless otherwise required by the context—

"Act" means the Motor Vehicle Information Cost Savings Act, as amended by Pub. L. 94-163.

"Light truck" is used in accordance with the determinations in 49 CFR Part 523.

"Captive import" means, with respect to a light truck, one which is not domestically manufactured but which is imported in the 1980 model year or thereafter by a manufacturer whose principal place of business is in the United States.

"4-wheel drive, general utility vehicle" means a 4-wheel drive, general purpose automobile capable of off-highway operation that has a wheelbase of not more than 110 inches, and that has a body shape similar to 1977 Jeep CJ-5 or CJ-7, or the 1977 Toyota Land Cruiser.

"Limited product line light truck" means a light truck manufactured by a manufacturer whose light truck fleet is powered exclusively by basic engines which are not also used in passenger automobiles.

"Basic engine" means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (as distinguished by number of carburetor barrels or use of fuel injection), and catalyst usage.

S533.5 Requirements

(a) Each manufacturer of light trucks shall comply with the following average fuel economy standards, expressed in miles per gallon, in the model year specified as applicable:

(b) (1) For model year 1979, each manufacturer may:

(i) Combine its 2- and 4-wheel drive light trucks and comply with the average fuel economy standard in paragraph (a) for 2-wheel drive light trucks; or

(ii) Comply separately with the two standards specified in paragraph (a).

(2) For model year 1979, the standard specified in paragraph (a) for 4-wheel drive light trucks applies only to 4-wheel drive general utility vehicles. All other 4-wheel drive light trucks in that model year shall be included in the 2-wheel drive category for compliance purposes.

Table 1

Model year	2-wheel drive light trucks		4-wheel drive light trucks		Limited product line light trucks
	Captive imports	Other	Captive imports	Other	
1979		17.2		15.8	
1980	16.0	16.0	14.0	14.0	14.0
1981	16.7	16.7	15.0	15.0	14.5
1982	18.0	18.0	16.0	16.0	—

Table 2

Model year	Conbined Standard		2-wheel drive light trucks		4-wheel drive light trucks	
	Captive imports	Others	Captive imports	Others	Captive imports	Others
1982	17.5	17.5	18.0	18.0	16.0	16.0
1983	19.0	19.0	19.5	19.5	17.5	17.5
1984	20.0	20.0	20.3	20.3	18.5	18.5
1985	19.5	19.5	19.7	19.7	18.9	18.9
1986	20.0	20.0	20.5	20.5	19.5	19.5
1987	20.5	20.5	21.0	21.0	19.5	19.5
1988	20.5	20.5	21.0	21.0	19.5	19.5
1989	20.5	20.5	21.5	21.5	19.0	19.0
1990	20.0	20.0	20.5	20.5	19.0	19.0
1991	20.2	20.2	20.7	20.7	19.1	19.1

Table 3

Model year	Combined Standard	
	Captive Imports	Others
1992	20.2	20.2
[1993	20.4	20.4
1994	20.5	20.5]

(56 F.R. 13773—April 4, 1991. Effective: May 6, 1991)]

(c) For model years 1980 and 1981, manufacturers of limited product line light trucks may:

(1) Comply with the separate standard for limited product line light trucks, or

(2) Comply with the other standards specified in § 533.5(a), as applicable.

(d) For model years 1982-91, each manufacturer may:

(1) Combine its 2- and 4-wheel drive light trucks (segregating captive import and other light trucks) and comply with the combined average fuel economy standard specified in paragraph (a) of this section; or

(2) Comply separately with the 2-wheel drive standards and the 4-wheel drive standards (segregating captive import and other light trucks) specified in paragraph (a) of this section.

(e) For model year 1992, each manufacturer shall comply with the average fuel economy standard specified in paragraph (a) of this section (segregating captive import and other light trucks).

S533.6 Measurement and calculation procedures.

(a) Any reference to a class of light trucks manufactured by a manufacturer shall be deemed:

(1) To include all light trucks in that class manufactured by persons who control, are controlled by, or are under common control with, such manufacturer; and

(2) To exclude all light trucks in that class manufactured (within the meaning of paragraph (a) (1) of this section) during a model year by such manufacturer which are exported prior to the expiration of 30 days following the end of such model year.

(b) The average fuel economy of all light trucks that are manufactured by a manufacturer and are subject to S533.5(b) or to S533.5(c) shall be determined in accordance with procedures established by the Administrator of the Environmental Protection Agency under section 503(a) (2) of the Act.

42 F.R. 13807
March 14, 1977

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 102

Transmission Shift Lever Sequence, Starter Interlock, and Transmission Braking Effect
(Docket No. 88-16; Notice 4)
RIN: 2127-AC-75

ACTION: Final rule.

SUMMARY: Standard No. 102 currently requires permanent display of gear position information for automatic transmission vehicles without a gear shift lever park position. This final rule replaces that requirement with one that requires display of gear position information only when the ignition is in a position in which the engine is capable of operation. The purpose of this amendment, which affects medium and heavy duty vehicles, is to facilitate the use of electronic technology. This final rule also amends the standard to require, for all automatic transmission vehicles, that full gear position information, i.e., identification of shift lever positions, including the position of the gears in relation to each other and the gear position selected, be provided in a single location.

EFFECTIVE DATES: The amendment to Standard No. 102's requirement for permanent display of gear position information for automatic transmission without a gear shift lever park position is effective April 25, 1991. The amendment adding § 3.1.4.4 to require, for all automatic transmission vehicles, that full gear position information be displayed in a single location is effective September 23, 1991.

SUPPLEMENTARY INFORMATION:

One of the stated purposes of Standard No. 102, *Transmission Lever Sequence, Starter Interlock, and Transmission Braking Effect*, is to reduce the likelihood of shifting errors. For many years, section S3.2 of the standard required identification of shift lever positions of all automatic transmission vehicles to be permanently displayed in view of the driver.

On July 11, 1989, NHTSA published in the *Federal Register* (53 F.R. 32409) a final rule amending Standard No. 102 for vehicles which have a shift lever position which puts the transmission in park. For those vehicles, the requirement for "permanent display" was replaced with a requirement that idenitification of automatic transmission shift lever positions be displayed in view of the driver whenever either of the following conditions exist: (a) the ignition is in a position in which the transmission can be shifted, or (b) the transmission is not in park. The purpose of the amendment was to facilitate the use of electronic displays, while ensuring that the information in question is displayed at all times when it may be needed for safety. In order to take advantage of the increased flexibility offered by the amendment, it is generally necessary for a vehicle to have both a park position and a transmission shift interlock system, i.e., a system which requires the shift lever to be in park before the ignition key can be removed and which prevents the shift lever from being moved from park after the key is removed.

NHTSA recognized a concern expressed by several commenters, including General Motors (GM), Ford, Navistar International, and the Motor Vehicle Manufacturers Association, that the proposed requirements would not facilitate the use of electronic technology in medium and heavy duty trucks, since those vehicles do not have a shift lever park position. The agency noted that the requirements recommended by those commenters were significantly different than those proposed in the NPRM and indicated that it would address that issue, as well as other issues related to Standard No. 102's display requirements, in a separate rulemaking.

On January 12, 1990, NHTSA published in the *Federal Register* (55 F.R. 1226) an NPRM addressing those issues.

First, for automatic transmission vehicles without a park position, the agency proposed to replace the permanent display requirement with one that would require display of gear position information only when the key is not in the "off" or "accessory" position. Under the proposal, such display would also not be required when the ignition switch is in a position that is used only to start the vehicle. NHTSA tentatively

concluded that the proposed amendment would maintain the safety aspects of the existing requirement while facilitating the use of electronic technology.

Second, for all automatic transmission vehicles, the agency proposed to require that full gear position information, i.e., identification of shift lever positions, including the position of the gears in relation to each other and the gear position selected, be provided in a single location. NHTSA tentatively concluded that the standard's purpose of reducing the likelihood of shifting errors is best met if all of the required information is available in one location.

Third, the agency responded to a suggestion by Volkswagen that the agency amend Standard No. 102 to provide greater flexibility for manual transmission pattern displays. That standard requires identification of the shift lever pattern of manual transmissions, except three forward speed manual transmissions having the standard "H" pattern, to be permanently displayed in view of the driver. Volkswagen recommended that electronic display technology be permitted as a sole indication of the manual transmission shift pattern. NHTSA indicated that it did not believe that the suggested amendment would be appropriate, given the safety purpose served by the requirement and the lack of need to change the requirement in order to facilitate the use of electronic displays.

NHTSA received five comments on the January 1990 NPRM. Four of the commenters addressed the agency's proposal to amend Standard No. 102's requirement for permanent display of gear position information for vehicles with automatic transmissions not having gear shift lever park positions. GM, Ford, and Chrysler supported the proposed amendment. Those commenters agreed that the proposed amendment would preserve the safety intent of the current requirement while improving design flexibility. A private individual, Mr. Robert Schlegel, commented that, in addition to not requiring display of gear position information in the "off" and "accessory" positions, the amendment should also not require display of that information in the "lock" position. That commenter stated that, for some designs, the "lock" position may be different from the "off" position.

With respect to Mr. Schlegel's comment, NHTSA notes that the ignition designs of medium and heavy duty trucks, the vehicles affected by the proposal, typically include only three positions: "off," "on," and "accessory." In the event that a manufacturer provided a "lock" position for these vehicles, however, as is often done for light vehicles, the agency agrees that display of gear position information should not be required for the "lock" position. The "lock" position is, in essence, a second "off" position. Moreover, it is the ignition switch position which is intended to be used when a vehicle is not being driven, and the vehicle's battery would be drained if electronic display of gear position information were provided in the "lock" position.

NHTSA has decided to issue an amendment along the lines of the proposal, while taking account of the possible design cited by Mr. Schlegel. Under the amendment being adopted, full gear position information must be displayed in all ignition switch positions in which the engine is capable of operation, with the exception of an ignition switch position that is used only to start the vehicle.

Three commenters addressed the agency's proposal to require, for all automatic transmission vehicles, that full gear position information be provided in a single location. GM and Ford supported the proposal. GM noted that it has made this a common practice and believes this helps the driver obtain gear position information in a timely manner.

Chrysler disagreed with the proposal to require full gear position information to be provided in one location. That company stated that the automotive industry is continuously seeking new ways to provide product innovation and distinction to gain a competitive edge in the market place, and it sees no reason to limit innovation in the area of gear position displays so long as the standard's purpose of reducing shifting errors is not jeopardized. Chrysler stated that it took exception with the agency's position that the need to check more than one location for full gear position information would unnecessarily increase the potential for driver hesitation and confusion and lead to greater likelihood of shifting errors. It noted that the process of shifting gears while driving necessitates some diversion of the driver's attention, particularly if the full gear information is located on a floor console. Chrysler argued that it would be less distracting to casually glance at the instrument cluster area for current gear position than down at a floor console. That company also argued that the need to direct full attention to the task of selecting a gear position is usually done before the vehicle is set in motion.

After considering the comments, NHTSA has decided to adopt the proposed amendment to require full gear position information, i.e., identification of shift lever positions, including the position of the gears in relation to each other and the gear position selected, to be provided in a single location. The agency continues to believe that the standard's purpose of reducing the likelihood of shifting errors is best met if all of the required information is available in one location. If the selected gear position is provided in one location, e.g., "DRIVE," and the positions of the gears in relation to each other, e.g., "P R N D L" or "P R N D 1 2" are provided in a different location, a driver may find it necessary to look back and forth between the two locations in changing gear positions. The agency believes that this would increase the potential for driver hesitation and confusion and lead to greater likelihood of shifting errors.

NHTSA disagrees with Chrysler's suggestion that this requirement will inappropriately limit innovation in the area of gear position displays. For the reasons discussed above, the agency believes that the requirement meets a safety need. Moreover, the requirement is not design restrictive. If Chrysler wishes to provide a display of current gear position information on the instrument panel, it is free to do so. Under the amendment, it can either provide full gear position information at that location, e.g., include a "P R N D L" label adjacent to the display of current gear position, or it can provide a display of current gear position information only on the instrument panel and include a display of full gear position information elsewhere, e.g., on the floor console.

One commenter, Chrysler, addressed the agency's response to a suggestion by Volkswagen that Standard No. 102 be amended to provide greater flexibility for manual transmission pattern displays. As indicated above, that standard requires permanent display of identification of the shift lever pattern of manual transmissions, except three forward speed manual transmissions having the standard "H" pattern. Volkswagen recommended that electronic display technology be permitted as a sole indication of the manual transmission shift pattern. NHTSA indicated that it did not believe that the suggested amendment would be appropriate, given the safety purpose served by the requirement and the lack of need to change the requirement in order to facilitate the use of electronic displays.

Chrysler argued that there is little difference between permitting electronic display of gear position information for automatic transmission vehicles without a "Park" position and allowing electronic display as the sole indication of gear shift pattern for manual transmission vehicles. It also argued that it does not believe that it is essential that the driver memorize the manual transmission shift pattern prior to the time the vehicle is started.

While NHTSA has considered Chrysler's comment, it reaffirms its view that the suggested amendment would not be appropriate. First, while the language of this requirement may appear to be similar to a requirement for permanent display of automatic transmission gear position information, the substance is quite different. While it is necessary to use a position indicator to show the shift lever positions of an automatic transmission, a simple label may be used to show the shift pattern of a manual transmission. The use of electronic technology is not relevant to these provisions, since they require only a simple label rather than a position indicator. Moreover, manufacturers desiring to supplement the required label with an electronic display are free to do so. Even if a manufacturer provides an electronic display for manual transmissions, the need to also provide a simple label depicting manual transmission shift pattern is not burdensome.

Second, such a label serves a safety purpose. In order to drive a manual transmission car, a driver should memorize the manual transmission pattern. If the manual transmission shift pattern is displayed prior to the time the vehicle is started, there is a greater opportunity for the driver to memorize the pattern. Chrysler argued that it is not essential that the driver memorize the manual transmission shift pattern prior to the time the vehicle is started, any more than the driver of an automatic transmission vehicle with electronic display of full gear information has to memorize the PRNDL information. The agency believes it is obvious, however, that there is a greater need for a driver to memorize a manual transmission shift pattern than an automatic transmission PRNDL pattern. Drivers must continuously shift manual transmissions as part of ordinary driving, including times when the vehicle is in motion. By contrast, automatic transmissions are only occasionally shifted while the vehicle is in motion. NHTSA continues to believe that the requirement for permanent display of manual transmission shift pattern provides a greater opportunity for the driver to memorize the pattern.

One commenter, Stone Bennett Corporation, asked whether the proposed requirements for automatic transmission vehicles without a gear shift lever park position would be met by certain designs for shift control consoles. In addition to including a mechanism for shifting the transmission (push buttons or toggle levers), the consoles incorporate a display which indicates the particular gear position which has been selected, e.g., "R" for reverse. No other gear positions are shown. In at least some of the designs, the display is an electronic one. Stone Bennett asked about the "acceptability" of providing a label indicating the gear position sequence on the body of the shift control console, e.g., "1 2 D N R." Drawings provided by the commenter indicate that the label would be provided directly adjacent to the gear position display.

NHTSA notes that, as indicated above, the requirements adopted today can be met by an electronic display of current gear position with an adjacent label indicating the gear position sequence. The electronic display and adjacent label would, of course, have to be in the view of the driver, and the electronic display would have to be activated whenever the ignition is in a position in which the engine is capable of operation (with the exception of an ignition position that is used only to start the vehicle).

Since the amendment to Standard No. 102's requirement for permanent display of gear position information for automatic transmission vehicles without a gear shift lever park position imposes no new requirements but instead increases manufacturer flexibility by relieving a restriction, the agency finds good cause for adopting an effective date of 30 days after publication of the final rule.

As discussed in the NPRM, NHTSA believes that all automatic transmission vehicles currently meet the requirement that full gear position information be displayed in a single location. For this amendment, the agency is adopting an effective date of 180 days after publication of the final rule.

1. S3.1.4.2 of § 571.102 is revised to read as follows:

S3.1.4.2 Except as specified in S3.1.4.3, if the transmission shift lever sequence does not include a park position, identification of shift lever positions, including the positions in relation to each other and the position selected, shall be displayed in view of the driver whenever the ignition is in a position in which the engine is capable of operation.

S3.1.4.4 is added to § 571.102 to read as follows: S3.1.4.4 Effective April 25, 1991, all of the information required to be displayed by S3.1.4.1 or S3.1.4.2 shall be displayed in view of the driver in a single location. At the option of the manufacturer, redundant displays providing some or all of the information may be provided.

Issued on: March 20, 1991

Jerry Ralph Curry
Administrator

56 F.R. 12469
March 26, 1991

MOTOR VEHICLE SAFETY STANDARD NO. 102

Transmission Shift Lever Sequence, Starter Interlock, and Transmission Braking Effect—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

S1. Purpose and scope. This standard specifies the requirements for the transmission shift lever sequence, a starter interlock, and for a braking effect of automatic transmissions, to reduce the likelihood of shifting errors, starter engagement with vehicle in drive position, and to provide supplemental braking at speeds below 25 miles per hour.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

S3. Requirements.

S3.1 Automatic transmissions.

S3.1.1 Location of transmission shift lever positions on passenger cars. A neutral position shall be located between forward drive and reverse drive positions. If a steering-column-mounted transmission shift lever is used, movement from neutral position to forward drive position shall be clockwise. If the transmission shift lever sequence includes a park position, it shall be located at the end, adjacent to the reverse drive position.

S3.1.2 Transmission braking effect. In vehicles having more than one forward transmission gear ratio, one forward drive position shall provide a greater degree of engine braking than the highest speed transmission ratio at vehicle speeds below 25 miles per hour.

S3.1.3 Starter interlock. The engine starter shall be inoperative when the transmission shift lever is in a forward or reverse drive position.

S3.1.4.1 Except as specified in S3.1.4.3, if the transmission shift lever sequence includes a park position, identification of shift lever positions, including the positions in relation to each other and the position selected, shall be displayed in view of the driver whenever any of the following conditions exist:

(a) The ignition is in a position where the transmission can be shifted.

(b) The transmission is not in park.

S3.1.4.2 [Except as specified in S3.1.4.3, if the transmission shift lever sequence does not include a park position, identification of shift lever positions, including the positions in relation to each other and the position selected, shall be displayed in view of the driver whenever the ignition is in a position in which the engine is capable of operation. **(56 F.R. 12469—March 26, 1991. Effective: April 25, 1991)**]

S3.1.4.3 Such information need not be displayed when the ignition is in a position that is used only to start the vehicle.

[**S3.1.4.4** Effective April 25, 1991, all of the information required to be displayed by S3.1.4.1 or S3.1.4.2 shall be displayed in view of the driver in a single location. At the option of the manufacturer, redundant displays providing some or all of the information may be provided. **(56 F.R. 12469—March 26, 1991. Effective: April 25, 1991).**]

S3.2 Manual transmissions.

Identification of the shift lever pattern of manual transmissions, except three forward speed manual transmissions having the standard "H" pattern, shall be displayed in view of the driver at all times when a driver is present in the driver's seating position.

February 3, 1967
32 F.R. 2410
February 3, 1967

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108
Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 30)
RIN: 2127-AD-18

ACTION: Final rule.

SUMMARY: This notice amends the humidity test procedures for replaceable bulb and integral beam headlamps specified in paragraph S8.7 of Motor Vehicle Safety Standard No. 108. The requirements remain unchanged, except that a photometric test is no longer required following completion of the humidity test. The purpose of the rule is to improve the repeatability of the humidity test. It accomplishes this by specifying the test fixture to be used, the position of the lamp in the test chamber, and the velocity of the air flow during the humidity test. This completes rulemaking pursuant to grants of petitions for rulemaking submitted by Hella K.G., Robert Bosch, and Koito Mfg. Co.

DATE: The effective date of the amendment is September 9, 1991.

SUPPLEMENTARY INFORMATION:

Background

On June 2, 1983, NHTSA amended Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* (49 CFR 571.108) to permit headlamps other than sealed beam units (48 F.R. 24690). One of the tests specified for headlamps with replaceable bulbs concerned resistance to humidity (now paragraph S8.7 of Standard No. 108). Shortly after the issuance of those amendments, some parties expressed concerns about that test. This rulemaking action responds to those concerns.

Hella Petition

On July 11, 1983, Hella K.G. of the Federal Republic of Germany petitioned for reconsideration of the amendments. Because the agency did not receive the petition until more than 30 days following publication of the amendment in the Federal Register, NHTSA treated it as a petition for rulemaking pursuant to 49 CFR Part 552, in accordance with the provision in its regulations on petitions for reconsideration regarding timeliness, 49 CFR Sec. 553.35(a). The portion of the petition relevant to this rulemaking action concerned the appropriateness of the humidity test procedures for vented headlamps. Specifically, Hella viewed the test as inappropriate, and stated that modified dust and moisture requirements should be substituted for it. While the agency did not agree, it was concerned about the effect of the test on vented headlamps. NHTSA believed that venting of headlamps affected the performance of lamps with plastic lenses in Standard No. 108's internal heat test, and thus might be desirable for some headlamp system designs. The agency wished to be able to distinguish inferior venting systems from superior ones. Therefore, NHTSA granted this aspect of the Hella petition, insofar as it related to a closer study of tests for ventilated headlamp systems, and initiated research on this subject.

Bosch Petition

On October 21, 1985, Robert Bosch GmbH, a headlamp manufacturer in Stuttgart, Germany, petitioned for a modification in the humidity test for replaceable bulb headlamps. In its view, the test did not fully account for actual operating conditions typical of vented headlamps. As a result of the heat generated in the test, the air in the interior of the lamp expands, with pressure compensation occurring through the ventilation openings. When the lamp cools, air enters the headlamp interior carrying moisture which is deposited in the interior of the headlamp. If there is no flow of air within the humidity test box, the 1-hour soak period is insufficient "to establish a well-balanced proportion between the humidity inside the headlamp and the outside conditions." Accordingly, Bosch argued that for judging compliance of vented headlamps "it is necessary that there is a flow of air inside the test box during the soak period." It believed that a flow of between 3 and 6 feet per second (2 to 4 m.p.h.) would be sufficient, when directed to the headlamp from the front.

NHTSA granted both the Hella and Bosch petitions on March 18, 1987 (52 FR 8482). Shortly thereafter, on April 30, 1987, Koito Manufacturing

Co. Ltd., a headlamp manufacturer in Japan, filed its own supporting petition for rulemaking to amend the humidity test. This petition was granted on July 14, 1989.

Koito Petition

Koito submitted test data on humidity and dust tests for many designs of vented headlamps. It found that if vents to eliminate water accumulation are too large, dust intrudes into the headlamps. Conversely, if the vents are too small, the lamps do not pass the humidity test. From the Koito test data, it appeared that headlamps could be designed to pass a humidity test with axial flow of air over the headlamp of between 2 m.p.h. and 4 m.p.h., the values recommended by Bosch, although without supporting data at that time. Koito's data indicate that by modifying the existing humidity test procedure to specify air flow velocity, the repeatability of the humidity test is improved.

Proposed Changes in Test Procedures

As NHTSA stated in March 1987, it had initiated its own test program on humidity testing, and submitted a copy of its test work to Docket 81–11; Notice 22. It had verified that moisture in lamps affects photometric performance. This test work led to further test programs to eliminate instances of inconsistent test results. On the basis of these tests, NHTSA developed the changes that it proposed in the humidity test in a notice published on November 27, 1989 (54 FR 48776).

The first change proposed was to the initial high-humidity "soak period." Currently, a 5-day high-humidity conditioning period is specified for headlamps before the low-humidity (dry-box) test is conducted. The high-humidity test consists of 20 on-off cycles during each of which the headlamp is energized for 1 hour and de-energized for 5 hours. NHTSA's research has demonstrated that headlamps cool off within 2 hours, so 3 hours of unproductive "off time" can be eliminated from each cycle without affecting the test results. Accordingly, it proposed that the high-humidity soak period consist of 24 cycles of 3 hours each, with the headlamps activated for 1 hour and deactivated for 2 hours. The specification of 24 consecutive cycles allows the test to start and end at the same time of day.

The agency had also tentatively concluded that repeatability would be improved by specification of a special test fixture for the humidity test. This fixture is simple and inexpensive. It would consist of a horizontal flat steel plate, at least ¼ inch thick, to which 3 threaded steel rods of ¼ inch diameter are mounted (at variable locations, depending on the headlamp). The headlamp would be affixed to the fixture by clamps. The clamps would be located behind the headlamp and out of the air stream. The plate would be as wide as the headlamp, and long enough to extend from the forwardmost edge of the headlamp past the rear of the headlamp sufficiently far to allow mounting to the three vertical mounting rods. Steel rods would be necessary to assure adequate strength since the headlamp may be cantilever mounted. Threaded rods would be necessary to screw into the mounting plate and allow easy attachment of horizontal clamps by thumb screw to the ¼ inch mounting rods.

However, Standard No. 108 presently requires that a photometric test be conducted following the humidity test, in addition to a visual inspection for water. In some cases, headlamps might have aim stability problems if attached to this fixture during a photometric test. If a choice must be made, the agency noted that it would prefer to drop the photometric test because it tentatively concluded that a special fixture is critical to running a repeatable air flow test to evaluate headlamp venting, and that a sufficient criterion of failure would be presence of moisture in the headlamp.

In the proposed test procedure, detailed requirements were specified for air flow uniformity, air velocity, the position of the lamp in the air flow test chamber, and humidity tolerance. The test and fixture would assure that undue turbulence is not present in the air flow test. The air flow uniformity should be plus or minus 10 percent of the average of velocities measured over the test grid 4 inches from the duct outlet over a 4-inch square grid at the plane of the front edge of the lamp. The velocities would be measured at 6 discrete points around the periphery of the lens, and the average velocity should be 330 ft/min +0–20 ft/min, which is an equivalent of 3.75 m.p.h. The fixtured lamp should be centered in the test chamber with at least 3 inches clearance on all sides between the lamp (exclusive of the fixture), and any part of the chamber, and located with the forwardmost edge of the lamp at least 4 inches from the air entry point. To enhance repeatability, the tolerances on humidity after the soak period would be reduced from the present 20 to 40 percent, to 30 to 40 percent. A test report showing fixtures and details of the set-up for the humidity test was placed under Notice 22 in Docket No. 81–11. The existing requirements for passing the humidity test remained unchanged in the proposal.

Comments to the Proposal

Six comments were received in response to the proposal. Three were from motor vehicle manufacturers, Ford Motor Company, General Motors Corporation, and Chrysler Corporation. The others were vehicle lighting equipment manufacturers, Koito,

Hella, and Ichikoh. The commenters raised issues with respect to six topics.

A. *Photometric Tests Following the Humidity and Air Flow Tests*

Section S7.4(i)(6) currently specifies the performance requirements to be met by a humidity test conducted in accordance with S8.7. Following completion of the test, the inside of the headlamp is to show no evidence of delamination or moisture, fogging or condensation visible without magnification, and the headlamp must then meet the photometric requirements that apply to its headlamp type. Although retention of the photometric test was generally supported by the vehicle manufacturers (albeit with qualifications such as the need to ensure compatibility of the test stand for photometric testing), Koito commented that the photometric test was unnecessary. NHTSA has reevaluated the requirement, and concurs with Koito's comment. The agency has observed the practical problem of conducting a photometric test when test point readings are constantly changing as droplets of moisture run down the lens and moisture evaporates from the lens and reflector. These effects cause the procedure to be non-repeatable since the coalescing and evaporation alter the readings. Given these effects, and the fact that a lamp will meet the humidity test requirement if there is no visible moisture in it, there is no need to demonstrate also its subsequent photometric performance. Additional loss of repeatability occurs when the lamp, attached to the humidity test fixture, is aimed using a mechanical or spot aimer attached to the lamp. The aimer causes torque to be applied to the lamp, causing it to deflect, with resulting misaim when the aimer is removed. Additionally, the lamp may deflect, causing further misaim, when it is mounted on a goniometer and positioned to measure test points because the once-vertical support rods are no longer vertical and may deflect.

On these last two issues, commenters concurred that the humidity test fixture may not be compatible with mounting the headlamp on a goniometer where exact positioning and stability of the headlamp is essential to proper photometric testing. Also, test results would differ between photometry tests done immediately after the humidity test, and those conducted after a sequence in which the headlamp was removed from the humidity test fixture, mounted on another fixture, aimed, and photometered, because of the motion, time, and additional effects of air flow during this sequence of events. Given the great likelihood of such variability, this is not a viable option even though suggested by some commenters.

Ford suggested that NHTSA develop a new fixture, suitable for both tests, or, alternatively, increase the time between the humidity air flow test and photometric test. However, such development would considerably delay implementing the revision that the industry has sought. Ford's suggested alternative, as noted previously, would increase the likelihood of a less repeatable procedure.

Therefore, NHTSA is amending Standard No. 108 to remove photometric compliance as a requirement for passage of the humidity test, leaving the sole criterion whether or not moisture is present.

B. *Test Mounting Fixture*

Under the proposal, the sole material specified for the mounting fixture was steel. Both GM and Chrysler considered this to be too restrictive. NHTSA concurs since aluminum could provide the requisite rigidity. Therefore, the final rule allows the optional use of aluminum. If aluminum is used, a mounting rod with a diameter larger than the ¼ inch may be required. The final rule requires it to be ½ inch.

Koito requested a clarification on how the headlamp is attached to the test fixture. In its test, NHTSA used thumb screw (chemistry laboratory type) rod clamps less than 2 inches in length in any direction. However, NHTSA does not believe that a particular method of attachment should be required. The choice of the method of attachment is left to the manufacturer or test laboratory.

C. *Humidity Exposure Test*

NHTSA proposed that the headlamp be subjected to 24 consecutive 3-hour test cycles, a reduction from the present requirement of 20 consecutive 6-hour cycles. GM requested a reduction to 8 consecutive 3-hour cycles, saying that it had run a series of tests using 5 and 20 cycles and finding consistent results between the two. If moisture was present at the end of 5 cycles, it was also present at the end of 20, and vice versa. Ichikoh believed that 20 cycles would be sufficient, saying that more humidity is absorbed in a 24-cycle regime than in a 20-cycle one. Chrysler concurred with NHTSA's proposed 24-cycle program. NHTSA believes that the performance of headlamps is directly related to the design of the headlamp's venting system, and that its proposal meets the requirements for safety. NHTSA has not conducted tests to either GM's or Ichikoh's different cycles and thus has no data to correlate with data from performing the 24-cycle plan. The agency is adopting the requirement for 24 consecutive 3-hour cycles as proposed because it is unable to determine whether other cycles recommended by commenters have the same consequences.

Under proposed S8.7(b), the relative humidity during the test would be not less than 90 percent. Hella argued that it would be more realistic to

specify the range in terms of a nominal value with a two-sided tolerance: 90 +/− 2 percent, which would be appropriate for most test chambers. NHTSA chose 90 percent as the minimum required for motor vehicle safety, and is adopting it as proposed, rather than the 88 to 92 percent range recommended by Hella.

D. *Air Flow Exposure Test*

Under the original and proposed rule, the headlamp is not energized when tested. Hella commented that vent function would be aided by switching the headlamp on and off during the air flow test. NHTSA declines to adopt this suggestion. The lamp must be designed so that it does not become fogged in the first place, or, if fogged, that the vents clear the lamp when it is unlit. Activating the lamp facilitates passing the test and thus does not represent a worst case scenario.

Currently, the range of relative humidity of the test chamber is 20 to 40 percent. Under the proposal, the range would be 30 to 40 percent. GM asked that the current requirement be maintained, as it was not aware of any basis for tightening the tolerance. The basis for NHTSA's proposal is a desire to eliminate differences in test results observed on the same headlamp in repeated testing. Reducing the humidity tolerance from 20 to 10 percent should result in more consistent test results. Therefore, it is adopting the range as proposed.

In proposed S8.7(e), the air flow velocity is 310 to 330 feet per minute measured with the test headlamp in place in the chamber. GM would eliminate any specification, commenting that empty chamber air velocity measurements alone are appropriate. Ford concurs with this comment. Ichikoh argued that the proposed air flow tolerance was too strict.

In response to Ford and GM, NHTSA has found that the effects of the size of a cross section of the chamber and the size of the headlamp will cause changes in air flow from the flow measured in an empty chamber. While these changes may not be noticeable in very large chambers (such as GM and Ford may have), they will exist in smaller ones, and for repeatability of the test, it is necessary to measure the flow with the headlamp in place. However, NHTSA is willing to provide a measure of relief by adopting an air flow specification of 300 to 330 feet per minute. This will reduce the necessity for recalibration of air flow for lamps of similar size and shape, thereby reducing time and expense.

According to the proposal, when the mounted headlamp assembly is placed in the air flow chamber, "the orientation of the assembly with respect to the air flow shall be identical to that of its position on any vehicle for which the headlamp is intended." Ford raised an objection, stating that the precise adjustment of the lamp cannot be made on the humidity test fixture, and that it would be impracticable to position the lamp in the chamber identically to its position on the vehicle. Ford recommended the term "design operating position" as a substitute. The agency has considered this comment. In the final rule, the headlamp assembly will be "oriented in its design operating position," the phrase used by the SAE in its standard on lamp testing, J575 JUL83. Although the essential intent of the language proposed and of the language adopted is the same, *i.e.*, to orient the lamp as it would normally flow through the air when mounted on its vehicle, the SAE phraseology is familiar to the industry, and NHTSA accedes to Ford's request.

E. *Use of Two Chambers*

The humidity test requires a humidifying chamber and an air flow chamber. Hella argued that one chamber would suffice. For reasons of practicality and repeatability, the agency has decided not to adopt Hella's suggestion. Standard size temperature humidity chambers are not available in the United States that allow enough length for the axial air flow test. Only specially built chambers can be used for both tests, but in general test laboratories do not have them. If a single chamber is used, the headlamp would have to be removed from the chamber and reinstalled in order to duplicate the routine when two chambers are used. If a choice is allowed between use of one and two chambers, the repeatibility of the humidity test could be affected.

Under the proposal, within 3 minutes of the completion of the humidity test, the headlamp assembly is to be removed and wrapped in a thermal blanket. Ford suggested that the removal time be reduced to 2 minutes, and the use of a thermal blanket eliminated. The agency has not adopted the suggestion for the reduction of time. The two test chambers may not be located closely enough to effect a transfer within 2 minutes (as NHTSA found in one test laboratory in trying out Ford's suggestion). NHTSA has eliminated the use of a thermal blanket, and substituted the use of an insulated box with foam packing material.

F. *Retention of Existing Test*

Chrysler believes that the agency should retain the existing humidity test if it determines that the air flow requirement during humidity testing and the concluding photometric tests are incompatible, because of the objectivity of the photometric requirements. Since the agency is deleting the requirement for photometric tests, the issue of compatibility does not arise.

1. Section S7.4(i)(6) is revised by deleting the comma and text following the word "magnification" and inserting a period in lieu thereof.

2. Section S8.7 is revised to read as follows:

S8.7 *Humidity.* (a) The test fixture consists of a horizontal steel plate to which three threaded steel or aluminum rods of ½ inch diameter are screwed vertically behind the headlamp. The headlamp assembly is clamped to the vertical rods, which are behind the headlamp. All attachments to the headlamp assembly are made behind the lens and vents or openings, and are not within 2 inches laterally of a vent inlet or outlet.

(b) The mounted headlamp assembly is oriented in its design operating position, and is placed in a controlled environment at a temperature of 100 + 7 − 0 degrees F (38 + 4 − 0 degrees C) with a relative humidity of not less than 90 percent. All drain holes, breathing devices, and other openings are in their normal operation positions for all phases of the humidity test. The headlamp shall be subjected to 24 consecutive 3-hour test cycles. In each cycle, it shall be energized for 1 hour at design voltage with the highest combination of filament wattages that are intended to be used, and then de-energized for 2 hours. If the headlamp incorporates a turn signal, it shall flash at 90 flashes per minute with a 75 + / − 2 percent current "on-time."

(c) Within 3 minutes after the completion of the 24th cycle, the air flow test will begin. The following shall occur: the mounted assembly shall be removed, placed in an insulating box and covered with foam material so that there is no visible air space around the assembly; the box shall be closed, taken to the air flow test chamber, and placed within it. Inside the chamber, the assembly with respect to the air flow shall be oriented in its design operating position. The assembly is positioned in the chamber so that the center of the lens is in the center of the opening of the air flow entry duct during the test. The headlamp has at least 3 inches clearance on all sides, and at least 4 inches to the entry and exit ducts at the closest points. If vent tubes are used which extend below the lamp body, the 3 inches are measured from the bottom of the vent tube or its protection. The temperature of the chamber is 73 + 7–0 degrees F (23 + 4–0 degrees C) with a relative humidity of 30 + 10–0 percent. The headlamp is not energized.

(d) Before the test specified in paragraph (e) of this section, the uniformity of the air flow in the empty test chamber at a plane 4 inches downstream of the air entry duct shall have been measured over a 4-inch square grid. The uniformity of air flow at each grid point is + / − 10 percent of the average air flow specified in paragraph (e) of this section.

(e) The mounted assembly in the chamber shall be exposed, for one hour, to an average air flow of 330 + 0–30 ft/min. as measured with an air velocity measuring probe having an accuracy of + / − 3 percent in the 330 ft/min range. The average air flow is the average of the velocity recorded at six points around the perimeter of the lens. The six points are determined as follows: at the center of the lens, construct a horizontal plane. The first two points are located in the plane, 1 inch outward from the intersection of the plane and each edge of the lens. Then, trisect the distance between these two points and construct longitudinal vertical planes at the two intermediate locations formed by the trisection. The four remaining points are located in the vertical planes, 1 inch above the top edge of the lens, and 1 inch below the bottom edge of the lens.

(f) After 1 hour, the headlamp is removed and inspected for moisture.

Issued on March 4, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 10185
March 11, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108
Lamps, Reflective Devices, and Associated Equipment

(Docket Nos. 81-11; Notice 31 and 85-15; Notice 14)

ACTION: Technical amendments; final rule.

SUMMARY: This notice contains technical amendments of the final rules published on May 9, 1989, and June 29, 1989, which established requirements for integral beam headlighting systems, and which responded to petitions for reconsideration of the final rule permitting Type HB2 standardized replaceable light sources. The amendments correct a dimensional error, a tolerance error, and the applicable SAE reference to motorcycle headlamps in Table III.

EFFECTIVE DATE: March 22, 1991.

SUPPLEMENTARY INFORMATION: On May 9, 1989, NHTSA published amendments to Federal Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* (54 FR 20066). As part of that final rule, labeling required for the lenses of Types F, G, and H headlighting systems must "be placed no closer to the geometric center of the lens than 2.75 in. (70 mm)." (See S7.3.8(f), S7.3.9(c), and S7.3.7(f) which erroneously uses the words "photometric center.") This is to ensure that there is no interference when a mechanical aimer is applied to the lens. The dimension of 2.75 in. (70 mm.) is the diameter of a mechanical aimer's rubber suction cup. The dimension that should have been specified is the radius of the suction cup, or one half the diameter. Thus, the standard should have specified a dimension allowing closer placement of the labeling to the geometric center, 1.375 in. (35 mm), and this notice corrects the error.

The same final rule amended Table III to remove the previous SAE references to motor vehicle headlamps, and replaced them with a general reference to S7. The SAE references to motorcycle headlamps, SAE J584, April 1964 and J566, January 1960 should not have been removed, and are reinstated.

On June 29, 1989, NHTSA further amended Standard No. 108 (54 FR 27362). This amendment incorporated requirements for Type HB2 standardized replaceable light sources, including an amendment to Figure 8 Bulb Deflection Test, to reflect the addition of Type HB2. An incorrect tolerance for Dimension "A," .012 inch, was provided. The correct tolerance is .016 inch. A correct Figure 8 is being published to correct the error.

In consideration of the foregoing, part 571 of 49 CFR is amended as follows:

In paragraph S7.3.7(f), the word "photometric" in the third sentence is changed to read "geometric."

In paragraphs S7.3.7(f), S7.3.8(f), and S7.3.9(c), the dimension "2.75 in. (70 mm)" is revised to read "1.375 in. (35 mm)."

In Table III, under "Headlamps," the last column "Applicable SAE standard or recommended practice * * * " is amended by adding to it "For motorcycles only, J584, April 1964, J566, January 1960."

Figure 8 is revised as shown below.

Issued on March 18, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 12123
March 22, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

(Docket No. 85–15; Notice 9)
RIN 2127–AE08

ACTION: Final rule.

SUMMARY: This rule deletes the impact test for replaceable bulb headlamps with plastic lenses. These lenses appear sufficiently strong that the test is no longer needed. The rule also updates the SAE J575 test procedure for headlamps referenced by Standard No. 108 by replacing the June 1980 version with that of December 1988. These amendments are based on a proposed rule published in May 1989.

That proposal dealt largely with an alternative to present headlamp systems, termed "roadway illumination systems," under which requirements would have been established for the lower beam, based upon computer models of the needs of different driving environments. However, in the wake of comments to the proposal, and the need for further research, NHTSA has decided not to go forward with this proposal at the present time.

The May 1989 notice also proposed the establishment of a docket to receive dimensional information of replaceable light sources in lieu of petitioning the agency for direct incorporation of new light sources into Standard No. 108. The agency plans to go forward with a supplemental proposal on this topic in the near future.

EFFECTIVE DATE: The effective date of the rule is September 26, 1991.

SUPPLEMENTARY INFORMATION: NHTSA published a proposed rule on May 9, 1989 (54 FR 20084) presenting the agency's recommendation for long-term simplification of Federal headlighting requirements. This took the form of a vehicle-based roadway illumination performance standard. NHTSA proposed an optional set of requirements under which manufacturers might use any type of headlighting system or light source they developed without the need to petition the agency for changes. Illumination would be provided by "roadway illumination devices" or "RIDs." A roadway illumination system composed of such devices was termed a "RIS." The agency received a large number of comments on this proposal from the motor vehicle and lighting industry, State officials, and individual citizens. In general, the commenters were not in favor of the proposal as written. Consequently, NHTSA has decided not to go forward with further rulemaking in this area at this time. The agency is conducting further research to develop the proposal and to better respond to commenters' concerns.

In the same notice, NHTSA also proposed that information regarding the dimensional specifications of the devices (and all new replaceable bulbs for more conventional headlamps) would be filed in an agency docket to ensure interchangeability. The intent was to remove from the rulemaking process the need to petition for the use of new headlamp light sources. Thus, to ensure that replaceable light sources manufactured for replacement are interchangeable with those used as original equipment, and that photometric performance equivalent to the original headlamp is provided, NHTSA proposed a new part 564, Replaceable Bulb Dimensional Information. Although generally in favor of this proposal, commenters have some concerns, as does NHTSA about its specifics. Consequently, the agency has decided to issue a Supplemental Notice of Proposed Rulemaking in the near future on this issue. The comments received will be addressed in that notice.

In the notice of May 9, 1989, the agency proposed deletion of the impact test for headlamps, and an update of SAE J575 as it pertained to headlamp testing. This final rule implements these two proposals.

The Impact Test and SAE Lighting Test Update

In its NPRM on short-term headlighting simplification published on December 29, 1987 (52 FR 49038), the agency asked for comments on the impact test for replaceable bulb headlamps with plastic lenses, without proposing its deletion. However, the comments received suggested deletion on the basis that plastics used for headlamp lenses were sufficiently impact-resistant. Accordingly, in May 1989, the impact test was not included in the series of proposed requirements and test procedures since it appeared to have been of little value during its existence in Standard No. 108. Since commenters

supported the proposal, Standard No. 108 is being amended to delete it.

Finally, with respect to test procedures, NHTSA proposed that, unless otherwise specified (such as for the vibration test), the version of SAE J575 applicable to headlamp testing be changed from that of June 1980 to that of July 1983, observing that the more recent version provides a more comprehensive and up-to-date test procedure. Commenters supported this proposal. Since that time, however, the SAE has issued a further update, that of December 1988. Inasmuch as there is no substantive change between this version and the one proposed (the later version corrects typographical errors in the earlier one), the agency is adopting the December 1988 version of SAE J575.

In consideration of the foregoing, 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

1. The authority citation for part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§571.108 [Amended]

2. In the last sentence of paragraph S6.1, with reference to SAE J575 the words "JUN80" are changed to "DEC88."

3. In Paragraphs S7.3.2(c), S7.3.7(h)(2)(i), and S7.3.8(d), the reference to paragraph "S8.9" is changed to "S8.8."

4. The following revisions are made in Paragraph S7.4(h):

(a) The first sentence is revised to read "A headlamp with a glass lens need not meet the abrasion resistance test (S8.2) or the chemical resistance test (S8.3)."

(b) In subparagraph (h)(i), the numeral "(8)" is changed to "(7)."

(c) Subparagraph (h)(i)(7) is removed.

(d) Subparagraph (h)(i)(8) is renumbered "(h)(i)(7)" and its reference to "S8.9" changed to "S8.8."

5. In Paragraph S7.4(h) and S7.5(i), the reference to "S8.10" is changed to "S8.9."

6. Paragraph S8.8 is removed, and paragraphs S8.9 and S8.10 are renumbered S8.8 and S8.9 respectively.

Issued on March 20, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 12463
March 26, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

(Docket No. 81-2; Notice 10)
RIN 2127-AD35

ACTION: Final rule.

SUMMARY: This notice requires that multipurpose passenger vehicles, trucks, and buses, whose overall width is less than 80 inches and whose GVWR is 10,000 pounds or less, be equipped with a center high-mounted stop lamp. This type of lamp has been required on new passenger cars since September 1, 1985. The agency has decided that similar crash-reduction and crash-severity reduction benefits will be attainable by extension of this requirement to other motor vehicles. The requirements are identical to those for passenger cars, except that a split CHMSL (*i.e.*, two smaller lamps meeting the requirements for a single lamp) will be allowed on vehicles whose rear vertical centerline falls between movable body panels such as doors.

DATES: The effective date for optional compliance with the final rule is September 1, 1992. The effective date for mandatory compliance is September 1, 1993.

SUPPLEMENTARY INFORMATION: This rule is based upon a notice of proposed rulemaking published on May 31, 1990 (55 FR 22039). Under the proposal, the center high-mounted stop lamp, presently required only on passenger cars, would be extended to the NHTSA-defined vehicle categories of multipurpose passenger vehicles, trucks, and buses, more specifically, those whose overall width is less than 80 inches, and whose GVWR is 10,000 pounds or less. Thus, the lamp would be required on all pickup trucks, vans, buses, sport-utility vehicles, truck-based station wagons, and motor homes within these width and weight parameters, and a variety of other types of trucks as well. For purposes of further discussion, NHTSA will use the term "light truck CHMSL" to identify the subject of this rulemaking.

Comments were received from the following motor vehicle manufacturers: American Suzuki Motor Corporation, Chrysler Corporation, Ford Motor Company, General Motors Corporation, Isuzu Motors Ltd., Mazda Research and Development of North America, Inc., Nissan Research and Development, Inc., Toyota Motor Corporate Services of North America, Inc., and Volkswagen of America, Inc. Final-stage manufacturers who commented were Gem Top East, Inc., Grote Manufacturing Company, Grumman Olson, Kois Brothers Equipment Company, Meyer Products, and Tailgater, Inc. Comments were received from the following lighting manufacturers: Hella, and K. G. Hueck & Company. Trade, public interest, and governmental associations submitting comments were: American Automobile Association, Citizens Concerned for Highway Safety, National Association of Governors Highway Safety Representatives, Recreational Vehicle Industry Association, National Automobile Dealers Association, National Truck Equipment Association, Truck Safety Equipment Institute, Insurance Institute for Highway Safety, and Coalition for Consumer Safety. Finally, comments were received from Spectrum Research and Development, Inc., and from numerous individuals.

Comments identified a number of issues relevant to the rulemaking, and the agency will discuss each of these in turn.

Adequacy of Research to Show Reduction in Rear End Collisions

The agency discussed the issue of the safety need for a reduction in rear end collisions at length in the NPRM. Interested readers are referred to that document for a full discussion. In brief, NHTSA cited accident statistics, the reduction in rear end collisions that it believes is attributable to the center lamp on passenger cars, and data indicating that a similar beneficial effect can be realized through installation of the center high-mounted stop lamp ("CHMSL") on vehicles other than passenger cars.

Certain parts of that discussion elicited comments, particularly with respect to the adequacy of the agency's evaluation of passenger car CHMSL effectiveness, and the field study NHTSA performed

before embarking on the rulemaking to extend the CHMSL to other vehicles.

Specifically, the most recent follow-up study (DOT HS 807 442 "An Evaluation of Center High-Mounted Stop Lamps Based on 1987 Data") indicates that cars equipped with the CHMSL are 17 percent less likely to be struck in the rear while braking than cars without the lamp. Interested in learning whether a similar reduction might occur if vehicles other than passenger cars were equipped with a CHMSL, NHTSA contracted with the National Public Services Research Institute (NPSRI) to conduct a study with respect to pickup trucks, mini vans, full size cargo type vans, and trucks with roll-back doors. A final report was rendered in May 1989, "The Effect of the Center High-Mounted Stop Lamp on Vans and Trucks" (DOT HS 807 506). This report has been placed in the docket. The results of this study showed an average improvement in brake reaction time of 0.09 second when the CHMSL was used. In a related experiment with a passenger car equipped with the CHMSL, the reduction in reaction time was 0.11 second. NHTSA decided that there is no statistically significant difference between the 0.11 second reduction in response time for passenger cars and the 0.09 second reduction in response time for vans/light trucks, indicating that the CHMSL would also be effective when installed on vehicles other than passenger cars. The agency sought comment on whether these results indicate further that the level of crash prevention effectiveness of CHMSLs installed on light trucks would be similar to that found for passenger car CHMSLs.

As stated above, the conclusion that light truck CHMSLs will be effective in preventing crashes and reducing the severity of those that do occur is based on (1) results of a series of tests conducted by the NPSRI on the reduction in mean brake response time of drivers following various types of CHMSL-equipped light trucks, as compared to the same trucks without CHMSLs, (2) tests of brake reaction times of drivers following CHMSL and non-CHMSL passenger cars that were conducted by the same company using the same procedures, and (3) the proven on-road effectiveness of passenger car CHMSLs. The test results showed that the CHMSLs produced statistically significant reductions in following-driver brake response time of .09 second for light trucks and .11 second for passenger cars. NHTSA stated that it did not consider this to be a significant difference and concluded that there was reason to expect that CHMSLs installed on light trucks would produce results similar to those found for passenger cars.

However, several manufacturers and a number of individuals spoke against or questioned the adequacy of the research to support requiring light truck CHMSLs. Ford disagreed with the derivation of the .09 second difference, and that company, Chrysler, and the National Truck Equipment Association questioned whether such a small improvement in mean brake response time of following drivers attributable to light truck CHMSLs was meaningful with respect to motor vehicle safety. They also noted the inconsistency of results for the different truck types and questioned the propriety of using the average result for all tests to support a CHMSL requirement pertaining to all light trucks. Ford and Chrysler also did not agree with the agency's conclusion that the similar results of the NPSRI light truck and automobile studies indicated that the benefits which could be expected from CHMSLs on light trucks would be similar to those found for passenger cars. They also stated reasons that they felt CHMSLs on light trucks would not be so effective as those on passenger cars. These reasons were related to the positions of the CHMSL and the standard brake lamps, and to the behavior of following drivers as influenced by truck rear end design, including the mounting height of standard brake lamps.

Some of the commenters remarked that there is a need for additional research because the NPSRI study stated, "No valid conclusions as to the collision-reduction benefit of the CHMSLs on vans and trucks can be offered on the basis of the data collected in this study." The agency disagrees with these comments. The NPSRI study was not designed to estimate a collision-reduction benefit. Rather, it was designed to determine the relationship between brake response time (BRT) and CHMSLs. The study accomplished this purpose, establishing a positive BRT–CHMSL relationship. The agency concludes that there is sufficient justification for issuing a requirement for CHMSLs on light trucks based on the similar braking response results found by NPSRI for CHMSL-equipped passenger cars and light trucks and the on-road benefits realized by CHMSL-equipped cars. Clearly, reductions in BRT will lead to reductions in collisions.

Several commenters questioned the accuracy and significance of the NPSRI study, stating that the BRT results were not consistent among the four vehicle types. The study clearly stated that the BRT results for each of the individual "cells" (*e.g.*, pickup trucks with triangulation, cargo vans with fixation) were not themselves statistically significant, only that their cumulative mean reduction in BRT of 0.09 second was. This overall reduction is based upon 1087 observations, 733 with the CHMSL and 354 without. Of all the studies of BRT measured in trapped car studies, the NPSRI study was the most rigorous, controlling for speed, headway, light conditions, and roadway geometry. In addition, the NPSRI

study collected significantly more data than any other study, including those cited by commenters. Thus, the agency believes that CHMSLs will be effective, although not necessarily equally effective, on the various types of light trucks. In order to reflect the possibility that the CHMSL may be somewhat less effective on light trucks than on passenger cars, the agency now estimates benefits more conservatively than it first estimated them. It is assumed that light truck CHMSL effectiveness could be lower, instead of equivalent to that found for passenger cars, by an amount proportional to the difference in the effect that these technologies were found to have on the brake response times of following drivers—.09/.11, or 82 percent as effective as for passenger cars.

Ford and Chrysler argued that a field study, along the lines of those conducted to support the passenger CHMSL requirement, was needed to support a light truck CHMSL regulation. The agency does not believe that a field study is necessary. The concept of the center lamp has been validated by the field studies that led to its adoption for passenger cars. The BRT tests are an acceptable surrogate for a field study in demonstrating that the concept remains valid for light trucks. Further, a field study would take 2–3 years to design, conduct, and analyze before proposing a rule based on these results. This would mean that a requirement for CHMSLs on light trucks, when providing for adequate leadtime, could be delayed as much as 3 years beyond the September 1, 1993 effective date that is specified in this final rule. As stated above, the agency believes the benefits of CHMSLs have been proven. Therefore, it will not delay implementation of a light truck CHMSL requirement more than is reasonably necessary to permit manufacturers to efficiently schedule their installation in their various truck models.

Location of the Lamp on Vehicles Other Than Passenger Cars

Issues relating to location concerned mounting the lamp outside the proposed range of 34 to 84 inches above the road surface, and the alleged impracticability of mounting the lamp on vehicles with double rear doors, on pickups with caps, and on certain types of utility and open-bodied vehicles.

On passenger cars, the center high-mounted stop lamp is located on the vehicle's vertical centerline, at a height not lower than 3 inches below the rear window. In the NHTSA study of vehicles other than passenger cars, two alternative locations were chosen for each vehicle type tested. On the pickup truck involved in the study, one location of the lamp was in the center at the top of the cab, and the other was in the center at the top of the tailgate (this was a Dodge Ram vehicle, mid-size, without a cap). The minivan was a Ford Aerostar, with one location of the lamp in the center on the roof line, and with the other location of the lamp in the center below the rear window. A Ford Econoline without a rear window served as the full-size cargo van. The alternative lamp locations for this type of vehicle were in the center at the eye level of a following driver, and at a point in the center halfway between the height of the stop lamps, and the roof line. On the straight truck with a roll-back door, a lamp was centered halfway between the road surface and the top of the vehicle. The other configuration was two lamps, one at each side of the vehicle, at the same height halfway between the road surface and the height of the vehicle.

Before initiating rulemaking, the agency asked several manufacturers of light trucks to comment on potential locations for the lamp. Nissan recommended that the lamp be installed near or on the roof. Mazda suggested that there could be as many as four installation locations for pickups, including the upper part of the rear window, and between the roof and rear window. Chrysler argued that no location was acceptable for pickups, as well as expressing concern that a high position might interfere with the identification lamps that are used to indicate wide vehicles. Grumman Olson provided detailed comments on all types of vehicles.

When all the comments were collated, no consensus emerged on a location for any type of vehicle. There appeared to be so many configurations of vehicles whose overall width is less than 80 inches, and whose GVWR is 10,000 pounds or less that the locational requirements cannot be specific. General Motors, however, provided a recommendation that afforded a basis for the eventual proposal: that a broad specification be adopted, allowing the center of the lens to be mounted at any point on the centerline from 34 to 84 inches above the road surface. The agency proposed this general requirement for the location of the lamp, believing that a minimum specification of 34 inches would enable manufacturers to install the lamp on certain vehicles where higher locations would not be practicable, and yet assure that the lamp would not be mounted much below the eye level of most drivers. NHTSA noted that vans of standard size manufactured by Ford, GM, and Chrysler are approximately 80 inches in height. With a maximum mounting height specification of 84 inches, manufacturers could install the center lamp above double rear doors on vehicles with such a rear configuration; in fact, NHTSA thought that this might be the most practicable location for the lamp.

However, at such a height, it might be necessary to propose additional photometric specifications for downward visibility of the lamp. At present, there is

a photometric requirement only for 5 degrees down. Given the probability that lamps on vehicles other than passenger cars may be mounted at a greater height than on passenger cars, a photometric requirement for 10 degrees down, and even 15 degrees down, might be justified. NHTSA invited specific comments on this point. The agency appreciated that problems might be encountered with complex vehicle designs for which even this general specification might not allow a satisfactory location, and therefore asked for specific comments on this point.

The agency also expressed its concern that additions such as a cap to a new or used pickup truck could reduce or eliminate the benefits of a center lamp. Such an addition could also violate the prohibition in the National Traffic and Motor Vehicle Safety Act against rendering Federally required safety equipment inoperative. If a cap were added to a pickup before its first sale for purposes other than resale and that cap rendered the center lamp noncompliant, the dealer selling the pickup would be liable for a civil penalty. If the cap were added to a pickup, after its first sale, by a vehicle manufacturer, distributor, dealer or vehicle repair business, so as to knowingly render the lamp partially or wholly inoperative, that individual or business also would be liable for a civil penalty. In view of the agency's concern about the potential reduction in benefits as a result of such installations, NHTSA sought comments on the types of additions made to completed pickup trucks that could interfere with the center lamp; whether those additions are typically made to new or used vehicles; whether those additions are typically made by vehicle dealers, cap dealers, repair businesses, vehicle owners, etc.; and the estimated percentage of pickup trucks that are likely to be equipped with caps at some point during their lifetime.

Finally, the agency asked that manufacturers, in commenting on the locational aspects of the proposal, keep in mind the apparent reasons for the center lamp's effectiveness in reducing rear end collisions for passenger cars: it provides an unambiguous stop signal; it is in the line of sight of following drivers; and it creates a triangular effect, or cue, to the eye because it has been higher than the stop lamps mounted on each side of the vehicle (though there is no specific requirement that it be). NHTSA noted that the configuration on vehicles other than passenger cars may differ in some respects. For example, the stop lamps may be mounted higher than on passenger cars, and in some instances in the same horizontal plane as a prospective center lamp, thus creating a linear rather than triangular effect.

Grumman Olson and others commented that the upper limit of 84 inches was an impractical limitation for installing CHMSLs on vehicles that have walk-in bodies with hinged, split, or roll-up rear doors. Grumman Olson requested exempting such vehicles, or barring that, extending the height limitation and modifying the photometric specifications, as appropriate. The agency agrees that an 84-inch mounting height is impractical for some vehicles and, therefore, is not specifying a maximum mounting height in the final rule. However, it is not excluding any categories of light trucks from the CHMSL requirement.

The NPRM requested comment on whether higher mounting heights necessitated additional photometric requirements beyond the current 5 degree down specification for passenger cars. General Motors commented it did not believe an additional down-angle photometric specification was needed; however, if one were prescribed, it recommended that it apply only to CHMSLs installed above 66 inches. Chrysler, Isuzu, Hella and Volkswagen recommended a 5 degree down angle as the maximum requirement. Ford recommended a 10 degree down angle for lamps mounted at 84 inches, and TSEI and Grote recommended adding a 10 degree down requirement for all light truck CHMSLs. Volkswagen argued that a 5 degree down specification was adequate for an 84-inch mounting height, given the observation angles of following drivers for typical following distances and driver eye heights. In response to these comments, NHTSA, is specifying only a 5 degree down angle for light truck CHMSLs, irrespective of mounting heights, the same requirement as for passenger cars. No convincing argument has been made that a 10-degree down photometric specification will enhance safety over a 5-degree down one at mounting heights above 84 inches for the relatively small number of vehicles on which such high mountings might occur. Further, adoption of the 5-degree requirement for all light trucks will mean that vehicle manufacturers may use a single lamp design for all their production.

Mazda requested that the minimum mounting height be set below the proposed 34 inches, saying that such a height would be design restrictive. Alternatively, it recommended that the CHMSL locational requirements be related to the rear window as it is for passenger cars, but with an exception for pickups specifying that no portion of the lens shall be lower than 10 inches below the top of the tailgate. These recommendations were made to accommodate CHMSL installation by Mazda on its mini-pickup for which it concluded that the best location for a CHMSL would be in the lower part of the tailgate, 31 inches above the ground. This location was selected to prevent the lamp from being obscured by cargo and caps that might be added, and

to position the CHMSL below the tailgate latch lever mechanism.

In addition, for those vehicles without a rear window, Mazda recommended language permitting a CHMSL to be mounted at the same height as the required stop lamps. However, if this suggestion were adopted, the lamps could be as low as 15 inches, the minimum mounting height for conventional outboard stop lamps. The agency is not adopting this recommendation since it would permit CHMSLs to be so low as to be ineffective for safety purposes, and substantially below CHMSLs already in the passenger car fleet. For the final rule, the required minimum mounting height remains at 34 inches.

Volkswagen and General Motors proposed allowing the CHMSL to be located within 6 inches of the centerline of the vehicle and allowing the CHMSL to be divided so as to be positioned on both sides of split rear doors. The commenters said that this would provide for an aesthetically acceptable mounting location when a vehicle's split rear doors extended to the top of the vehicle. Chrysler and Suzuki mentioned that their on/off road multipurpose passenger vehicles (MPVs) are designed for high ground clearance and have minimal interior storage space for the spare tire. The tire is, therefore, mounted on the tailgate and covers the center of the sheet metal there. These companies stated that an offset CHMSL mounting would facilitate CHMSL installation on these and similar vehicles.

One of the most fundamental aspects of the CHMSL has been its center location. The value of any signal lamp depends significantly on its ability to provide unambiguous information about the intent or action of the driver to other drivers, in this case, that the driver is applying the brakes. All CHMSLs are presently mounted on the vehicle's centerline, and changing the lamp's center location may reduce its benefit to following drivers. Therefore, the agency is requiring light truck CHMSLs to be mounted on the vehicle centerline. However, to facilitate mounting on vehicles with split rear doors, the agency is permitting two identical CHMSLs of a minimum luminous effective lens area of 2¼ inches each to be mounted at the same height and adjacent to each other where the doors close. When photometered together they are required to meet the minimum photometrics of Figure 10, and when viewed together, to provide signal visibility through a continuous angle from 45 degrees to the right to 45 degrees to the left. However, this configuration will be allowed only if there is no room on the body structure above the doors to install a single lamp. In addition, CHMSLs can still be installed on vehicles with some centerline obstruction in other locations such as the roof, tailgate, roll bar, soft top frame, or, as Suzuki proposes for the Sidekick, on a pedestal located on the tailgate behind the spare tire.

Twenty-one individuals suggested that an alternative location for the CHMSL be the widest part of the vehicle, most recommending near the side view mirrors. Commenters suggested this alternative location for the CHMSL on light trucks because they felt the research results were not conclusive and that this location would be a good alternative to that which was proposed. However, as the agency has stated in the past year in corresponding with various proponents of this type of proposal, there was no evidence showing any improvement in safety from this concept. Further, given the resulting close proximity of the CHMSLs and mirrors, the effectiveness of the mirrors could be significantly diminished, should glare from the lamps shine into the driver's eyes. Therefore, the agency is not adopting this mounting location.

Finally, there was no consensus among the commenters regarding triangulation, i.e., whether the effectiveness of the center lamp on passenger cars is due, in part, to the fact that it is mounted higher than the standard stop lamps.

Practicability and Utility of a CHMSL on Some Vehicle Types

The NPRM requested comments on whether certain vehicle types or configurations presented problems with respect to the installation and operation of CHMSLs. Chrysler, Ford, and Isuzu argued that pickup trucks have no practicable location for CHMSLs. It was stated that if a CHMSL were placed on the cab, cargo could block its view from following drivers and cargo shifts could subject it to damage. Further, if the CHMSL were placed on the tailgate, it would be subject to damage and obscuration if the gate were lowered. The agency recognizes that CHMSLs might not be seen by following drivers in such situations, but it believes that these situations will occur relatively infrequently and that pickup trucks will be driven the great majority of the time without obscuration of CHMSLs mounted on the cab or tailgate. The safety benefits to be realized when the CHMSLs are visible easily justify requiring them.

The Recreational Vehicle Industry Association, National Automobile Dealers Association, and Chrysler expressed concern that CHMSLs mounted on pickup trucks would be obscured by aftermarket slide-in campers or caps (depending on the location of the CHMSL). Under the Vehicle Safety Act, manufacturers, dealers, distributors, or motor vehicle repair businesses may not install campers or other equipment on new or used vehicles that would obscure the original mandated CHMSL without providing an auxiliary CHMSL, as this obscuration

would be "rendering inoperative" a mandated safety device. However, this prohibition does not apply to vehicle owners. Therefore, they could use slide-in campers or caps that obscure the original CHMSL. However, the agency believes that slide-in campers, which are not part of the original pickup design and hence are accessory equipment, are typically intended for occasional use, and the CHMSL would only be obscured for a relatively short period of time on those vehicles whose owners have purchased them. More importantly, if owners of these vehicles perceived the additional safety protection offered by CHMSLs, they might demand that manufacturers of campers equip them with CHMSLs. The marketplace, together with the render inoperative prohibition, should induce manufacturers of campers to equip them with CHMSLs.

In accordance with the existing provisions of 49 CFR Parts 567 and 568, those who alter vehicles completed by others, and final-stage manufacturers of multi-stage vehicles, must assure that the CHMSL requirement is met. The National Truck Equipment Association and some final-stage vehicle manufacturers (Kois Brothers Equipment Company, Meyer Products, and Tailgater, Inc.) argued that there was no practical location for CHMSLs on many of the types of equipment and body types added by final-stage manufacturers to pickups and incomplete vehicles. These commenters provided examples and illustrations of such vehicles including dump bodies, hydraulic liftgates, utility body toppers, salt spreaders, stake trucks, and wreckers, among others. They stated that special wiring and locational considerations would make CHMSLs on many of the vehicles they produce substantially more costly than that estimated by the agency. Further, not only would CHMSLs be very difficult to install, the wiring and lamps would be subjected to abuse in heavy work and recreational situations; consequently, durability and maintenance would be a problem.

Despite their comments, data sheets provided by Kois, Meyer, and the NTEA show that installation of CHMSLs would not be as difficult as they believe. For example, the literature related to stake bodies (*i.e.*, platform bodies with removable vertical side and rear panels) indicated that they are equipped with clearance and identification lamps on the rear frame of the platform. CHMSLs could be used in place of the center-located identification lamps, since these vehicles, less than 80 inches wide, are not required by Standard No. 108 to carry identification lamps.

It was also stated that the salt spreader would not be capable of having a CHMSL, because of difficulty in providing electrical power to the lamp through the spreader structure. However, one of the models comes complete with a cab-mounted electrical control panel. Certainly, the spreader could have a CHMSL with wiring and power provided by this in-cab panel. Based on the data sheets provided by Kois, Meyer, and the NTEA data sheets for many different bodies and equipment, it appears that many other multi-stage vehicles have similar convenient means of providing the necessary electrical hook-up. The agency is presenting below possible CHMSL locations for each of the rear end configurations provided by Kois, Meyer, and/or the NTEA in their comments:

- LIFT GATES: the rear face of the cab, top of the cab or (with more difficulty) on a protected or recessed portion of the lift gate.
- SERVICE BODIES: the rear face of the cab, top of the cab, the tail gate, or on an overhead ladder or pipe rack, if so equipped.
- COVERED UTILITY BODY: the tailgate, the rear gate, the rear face of the body compartment, or on the top of the body compartment.
- SPREADERS: depending upon the spreader dimensions, the CHMSL could be located on the rear face of the cab, the top of the cab, or the spreader frame. In addition, as suggested by Suzuki for open-bodied vehicles, the CHMSL could be mounted on a bracket which positions the CHMSL at the proper height on the vehicle centerline.
- TIPPERS—DUMP BODIES: the rear gate, the rear face of the tipper's forward bulkhead, the rear edge of the cab shield, or below the rear gate on the rear face of the dump body.
- STAKE BODIES: the rear face of the platform, where Kois presently positions identification lamps which are not required.
- "PANEL BODIES" WITH SLIDING OR HINGED DOORS: for each of the eight configurations presented by Kois and NTEA, the CHMSL could be substituted for the existing identification lamps that are not required by Standard No. 108.
- BUCKET—CHERRY PICKER TRUCKS: the CHMSL could be located on the rear tailgate (if so equipped), or on the bucket itself.

With some of the different types of light trucks and vans, it may be more difficult for the manufacturer to comply with this regulation. However, NHTSA believes that the perceived installation difficulties are surmountable. The agency believes that the final-stage manufacturers can conquer the apparent difficulties. For example, as mentioned above, Kois already provides stake trucks with identification lamps which could easily be replaced by a CHMSL.

There are also practicable CHMSL mounting locations on open-bodied, sport-utility vehicles, as discussed above (e.g., Jeep Wrangler, Geo Tracker, Su-

zuki Sidekick). These open-bodied vehicles have roll bars, tailgates, and top superstructures available for CHMSL mounting. These solutions may be somewhat more complex and costly than for vanbodied vehicles, but they are still practicable.

Other Performance Requirements

Other requirements are similar to those specified for passenger car CHMSLs. The lamp lens area must be a minimum of 4½ square inches and, if mounted inside the rear glazing, means must be provided to minimize reflections from the light of the lamp upon the rear window glazing that might be visible to the driver when viewed directly or indirectly in the rearview mirror. As discussed above, the photometric requirements are those specified for passenger cars in Figure 10 of Standard No. 108.

Combining the Center Lamp With Other Vehicle Equipment

Chrysler, Ford, and General Motors requested the CHMSL be permitted to be combined with the cargo-bed lamp typically found on the rear of the cab of pickup trucks. They reasoned that despite the specific prohibition in S5.4 against the combining of a CHMSL with any other lamp, the combination of a CHMSL with a cargo lamp would have absolutely no negative safety effect because of the nature and use of the two lamps. However, because the notice of proposed rulemaking did not propose a variance from the general prohibition, NHTSA cannot at this time adopt a final rule based upon the comments requesting it. Accordingly, it is publishing a proposal simultaneously with this final rule to permit the physical combination of cargo-bed lamps with light truck CHMSLs.

Effective Dates

In proposing an effective date for vehicles other than passenger cars, the agency followed the example it set in the passenger car rulemaking. There, the agency adopted a mandatory effective date that was approximately 2½ years after the issuance of the final rule, allowing 2 full model years for manufacturers to achieve compliance. NHTSA has determined that installation of the lamp on some designs of multipurpose passenger vehicles and buses is no less complex than installation on cars, and that mandatory compliance should not be required for the next 2 model years (1992 and 1993). Accordingly, it is hereby found that good cause is shown for an effective date of the final rule later than 1 year after its issuance. The effective date of the final rule is September 1, 1993.

NHTSA allowed passenger car manufacturers optional use of the center lamp in the year preceding the mandatory effective date. The agency has decided to allow manufacturers of vehicles other than passenger cars to install the center lamp in the year preceding the mandatory effective date, provided that the lamp meets all requirements. Because this step may affect manufacturers who are presently installing the center lamp on vehicles other than passenger cars, and whose designs may not meet the requirements of the final rule, it is hereby found that good cause is shown for an effective date later than 1 year after issuance of the final rule. The effective date for optional compliance is September 1, 1992.

Manufacturers presently installing conforming center lamps on vehicles other than passenger cars, or who wish to do so before September 1, 1992, are subject only to the general prohibition of paragraph S5.1.3 that no additional lighting equipment may be installed that impairs the effectiveness of lighting equipment required by Standard No. 108.

Costs

The cost of installing a CHMSL on a light truck depends on the type of lamp assembly selected by the manufacturer, the nature of any necessary modifications to the vehicle's electrical system, and the nature of any other vehicle modifications that might be necessary to provide a suitable location for the lamp to be mounted. Manufacturer and dealer markup and taxes must be added to calculate the consumer purchase price increase due to the addition of CHMSLs. In the agency's evaluation of passenger car CHMSL performance, the 1987 sales-weighted price increase attributable to a CHMSL was estimated to be $9.05. Increasing this value to account for inflation in 1988 and 1989 produces an estimated consumer price increase for a passenger car CHMSL of about $9.50.

In addition to the cost of installing the CHMSL, a lifetime fuel penalty due to the slight increase in vehicle weight must be accounted for. Historically, the agency has assumed that each incremental pound of light truck weight would increase lifetime fuel consumption costs by $1.14. It is impossible to make a reliable prediction at this time when oil prices are fluctuating widely on a daily basis, but given the almost indiscernible impact of the lamp on lifetime fuel consumption, the agency does not believe that the lifetime fuel consumption costs would exceed $1.30. NHTSA's studies estimate the average weight of passenger car CHMSLs to be 0.95 pound. Assuming a similar weight for light truck CHMSLs, the estimated increase in the lifetime fuel consumption costs for a light truck CHMSL would be about $1.25. Finally, about $0.50 (present value) must be added to the cost of operating a CHMSL for bulb replacement purposes. Thus, the lifetime consumer

cost per truck CHMSL in 1989 dollars is estimated to be $11.25.

This is believed to be a reasonable estimate in those cases where the CHMSL installation on light trucks is a fairly simple procedure, similar to that for passenger cars. This would appear to be the case for most light trucks. However, the cost of a CHMSL on many of the more complex vehicle configurations in use (those produced by multi-stage manufacturers) will probably be higher. The agency estimated that the cost of the more complex configurations would average 50 percent higher and requested comments on the specific types of trucks (e.g., wrecker, stake, dump, tall vans with split or roll-up doors), on which mounting a CHMSL would be more difficult and the associated additional expense. The sales volumes of these vehicles were also requested so that the agency could adjust its cost estimates, as appropriate.

Three commenters disagreed with the agency's cost estimate for CHMSLs on multi-stage vehicles. Gem Top, which manufactures truck tops for commercial fleet users, said that some of its customers ordered "a collision avoidance light" (third stop lamp), centered above the rear door. The company said $40 was a far more realistic price for this lamp. Kois Brothers Equipment Company, a truck equipment supplier, said the average price for installation in its shop would be $57.50. The third commenter, NTEA, provided illustrations of multi-stage vehicles for which CHMSL installation would be more difficult, and stated that modifications by cap manufacturers on some vehicles where an original CHMSL was obscured by a cap would cost $50–$200. These commenters, however, did not provide any detailed information explaining their cost figures, e.g., information identifying the portion attributable to additional wiring, body modification, or more costly CHMSL design. Therefore, the agency has no basis for judging the merit of these figures.

At the same time, the agency agrees that installing CHMSLs on some vehicle types that are produced by final-stage manufacturers will be more difficult and costly. However, as these manufacturers gain more experience in installing CHMSLs, in selecting the optimal designs and mounting locations determined for the various types of vehicle bodies and equipment, and as the lamps are produced and installed in quantity, prices should drop markedly. Further, the agency notes that many multi-stage vehicles, including many vans, utility caps, and a variety of other pickup-based bodies, have readily accessible mounting locations, such as on the cab, above or on split van doors, and on tailgates. The agency concludes that an estimated average consumer cost of installing CHMSLs on multi-stage manufactured vehicles would be 50 percent higher than that for other light trucks, or $17.00, is reasonable. The agency emphasizes that this is an *average* cost, and that some CHMSL installations will cost more; others will cost about the same as those installed by the single-stage manufacturers. Indeed, the originally installed CHMSL may be effective on many multi-stage vehicles.

In consideration of the foregoing, 49 CFR part 571 is amended as follows:

"S5.1.1.27 (a) Except as provided in paragraph (b) of this section, each passenger car manufactured on or after September 1, 1985, and each multipurpose passenger vehicle, truck, and bus, whose overall width is less than 80 inches, whose GVWR is 10,000 pounds or less, manufactured on or after September 1, 1993, shall be equipped with a high-mounted stop lamp which:

(1) Shall have an effective projected luminous area not less than 4½ square inches.

(2) Shall have a signal visible to the rear through a horizontal angle from 45 degrees to the left to 45 degrees to the right of the longitudinal axis of the vehicle.

(3) Shall have the minimum photometric values in the amount and location listed in Figure 10.

(4) Need not meet the requirements of paragraphs 3.1.6 Moisture Test, 3.1.7 Dust Test, and 3.1.8 Corrosion Test of SAE Recommended Practice J186a if it is mounted inside the vehicle.

(5) Shall provide access for convenient replacement of the bulb without the use of special tools.

(b) Each multipurpose passenger vehicle, truck and bus whose overall width is less than 80 inches, whose GVWR is 10,000 pounds or less, whose vertical centerline, when the vehicle is viewed from the rear, is not located on a fixed body panel but separates one or two movable body sections, such as doors, which lacks sufficient space to install a single high-mounted stop lamp on the centerline above such body sections, and which is manufactured on or after September 1, 1993, shall have two high-mounted stop lamps which:

(1) Are identical in size and shape and have an effective projected luminous area not less than 2¼ inches each.

(2) Together have a signal to the rear visible as specified in paragraph (a)(2) of this section.

(3) Together have the minimum photometric values specified in paragraph (a)(3) of this section.

(4) Shall provide access for convenient replacement of the bulbs without special tools.

3. Paragraphs S5.1.1.28, S5.1.1.29, S5.1.1.30, and S5.1.1.31 are redesignated respectively S5.1.1.29, S5.1.1.30, S5.1.1.31, and S5.1.1.32.

4. New paragraph S5.1.1.28 is added to read:

S5.1.1.28 A multipurpose passenger vehicle, truck, or bus, whose overall width is less than 80 inches, and whose GVWR is 10,000 pounds or less,

0that is manufactured between September 1, 1992 and September 1, 1993, may be equipped with a high-mounted stop lamp or, in the case of vehicles subject to S5.1.1.27(b), two high-mounted stop lamps, that conform to S5.1.1.27 and S5.3.1.8.

5. Section S5.3.1.8 is revised to read as follows:

S5.3.1.8. (a) Each high-mounted stop lamp installed in or on a vehicle subject to S5.1.1.27(a) shall be located as follows:

(1) With its center at any place on the vertical centerline of the vehicle, including the glazing, as the vehicle is viewed from the rear.

(2) If the lamp is mounted below the rear window, no portion of the lens shall be lower than 6 inches below the rear window on convertibles, or 3 inches on other passenger cars.

(3) If the lamp is mounted inside the vehicle, means shall be provided to minimize reflections from the light of the lamp upon the rear window glazing that might be visible to the driver when viewed directly, or indirectly in the rearview mirror.

(b) The high-mounted stop lamps installed in or on a vehicle subject to S5.1.1.27(b) shall be located at the same height, with one vertical edge of each lamp on the vertical edge of the body section nearest the vertical centerline.

6. In the second column of Table III for the item "High-mounted stop lamp," the text "1 red, for passenger cars only" is revised to read "1 red."

7. In the second column of Table IV for the item "High-mounted stop lamp," the text "On the rear, on the vertical centerline [See S4.3.1.8], effective September 1, 1985, for passenger cars only" is revised to read "On the rear, on the vertical centerline [See S5.1.1.27, S5.3.1.8, and Table III]."

8. In the fourth column of Table IV for the item "High-mounted stop lamp," the text "[See S4.3.1.8]" is revised to read "See S5.3.1.8 for passenger cars. Not less than 34 inches for multipurpose passenger vehicles, trucks, and buses."

Issued on April 11, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 16015
April 19, 1991

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108
Lamps, Reflective Devices, and Associated Equipment

(Docket No. 89–24; Notice 4)
RIN: 2127–AC–77

ACTION: Final rule.

SUMMARY: This notice responds to comments to a supplemental notice of proposed rulemaking published in November 1990. That notice proposed amending Standard No. 108 to adopt a definition similar to the SAE definition of "optical combination." In response to comments received on the supplementary notice, NHTSA is not adopting the definition, but is amending Standard No. 108 simply to reference the SAE definition where appropriate.

DATE: The effective date of the amendment is July 8, 1991.

SUPPLEMENTARY INFORMATION: On November 8, 1990, the agency issued a supplemental notice proposing to amend Federal Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* to adopt a definition of the term "optical combination" similar to that of the Society of Automotive Engineers (SAE) (55 FR 46961). The supplemental notice contained a discussion of the agency's prior proposal that led to both a minor amendment and the supplemental notice. The reader is referred to the supplemental notice for further background information on this subject.

Motor Vehicle Safety Standard No. 108 allows two or more lamps, reflective devices, or items of associated equipment to be combined, if the requirements for each are met, provided that certain lamps specified in sections S5.1.1.26 and S5.4 are not "optically combined." The term is also contained in two SAE standards incorporated by reference.

Specifically, S5.4 provides that "no clearance lamp may be optically combined with any taillamp, and no high-mounted stop lamp shall be combined with any other lamp or reflective device."

With respect to use of the term elsewhere in Standard No. 108, paragraph 4.2 of SAE Standard J586c *Stop Lamps,* August 1970, and paragraph 4.4 of SAE Standard J588e *Turn Signal Lamps,* September 1970, both state "When a stop signal is optically combined with the turn signal, the circuit shall be such that the stop signal cannot be turned on in the turn signal which is flashing." Finally, the second sentence of section S5.1.1.26 of Standard No. 108, states that "A stop lamp that is not optically combined with a turn signal lamp shall remain activated when the turn signal is flashing."

The agency has never adopted a definition of "optically combined," but over the years it has attempted to clarify the term by issuing a variety of interpretations. This led to some confusion, and on December 5, 1989, the agency proposed amendments with the intent of substituting clarifying phrases for the term "optical combination" (54 FR 50254). Virtually all persons who commented on that notice recommended that NHTSA adopt the definition of "optically combined" as set forth in SAE Information Report J387 NOV 87 *Terminology—Motor Vehicle Lighting.* Under the SAE definition,

> "a lamp shall be deemed to be 'optically combined' if both of the following conditions are met:
> A. It has two or more separate light sources, or a single light source that operates in different ways (e.g., a two filament bulb).
> B. Its optically functional lens area is wholly or partially common to two or more lamp functions."

NHTSA reviewed these comments and found them persuasive. Accordingly, in November 1990, it issued a supplemental notice proposing an amendment of S3 to add a definition quite similar to that of the SAE. Although the notice gave the impression that the SAE definition used as a reference was that of the October 1988 Information Report, the text was based, in fact, upon the text of the November 1987 standard. Under NHTSA's proposed definition:

> "'Optically combined' means a combination within a lamp of two or more separate light sources, or a single light source that operates in different ways, such as a dual-filament bulb, where its optically functional lens area is wholly or partially common to two or more lamp functions."

Six commenters responded to the new proposal: General Motors Corporation, Truck Safety Equip-

ment Institute (TSEI), Freightliner Corporation, Grote Manufacturing Company, Ford Motor Company, and Chrysler Corporation. All commenters believed that a definition was desirable. In general, commenters believed that the proposed definition was still confusing and misleading. TSEI, for example, noted that the SAE language "Two or more separate light sources or a single light source that operates in different ways" differs from similar language proposed by NHTSA: "a combination within a lamp of two or more separate light sources or a single light source that operates in different ways." TSEI wondered whether "combination" referred to the two or more light sources which becomes mutually exclusive when used with the word "separate" or to the light source(s) and the optically functional common lens area. Grote asked whether a lamp presently in use composed of a single light source with a single filament used as combination stop and turn signal lamps would be allowable under the proposed NHTSA definition. Commenters continued to recommend adoption of the SAE definition, noting the discrepancy between the preamble references to the 1988 version and the similarity of the proposed text to the 1987 version, and expressing a preference for the greater inclusiveness of the earlier one.

Upon review of these comments, NHTSA concluded that the meaning of the 1987 SAE definition was evidently clearer to regulated parties than the similar definition proposed in November 1990, and that it should be adopted. However, the phraseology used by the SAE did not prove adaptable to the structure of Standard No. 108's definition section, S3. Therefore, rather than adopting the SAE definition as its own, NHTSA is amending S5.1.1.26 and S5.4 to add the phrase "as defined in SAE Information Report J387 *Terminology—Motor Vehicle Lighting* Nov 87" after the phrase "Optical combination" in each of these sections. A new section is also added to clarify that the SAE definition of "optical combination" that applies to the two 1970 SAE standards incorporated by reference is the 1987 version.

Effective Date

Because the final rule clarifies existing prohibitions, and imposes no additional burden upon any regulated party, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance of the rule is in the public interest. Accordingly, the amendment is effective 30 days after publication in the *Federal Register.*

In consideration of the foregoing, 49 CFR Part 571.108 Motor Vehicle Safety Standard No. 108 *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

1. The second sentence of S5.1.1.26 is revised to read:

S5.1.1.26. * * * A stop lamp that is not optically combined, as defined by SAE Information Report J387 *Terminology—Motor Vehicle Lighting* NOV 87, with a turn signal lamp shall remain activated when the turn signal lamp is flashing.

* * * * *

2. S5.4 is revised to read as follows:

S5.4 Two or more lamps, reflective devices, or items of associated equipment may be combined if the requirements for each lamp, reflective device, and item of associated equipment are met, except that no clearance lamp may be combined optically, as defined by SAE Information Report J387 *Terminology—Motor Vehicle Lighting* NOV 87, with any taillamp, and no high-mounted stop lamp shall be combined with any other lamp or reflective device.

* * * * *

3. Section S6.1 is amended by adding the following sentence at the end thereof:

S6.1. * * * The definition of "optically combined" in SAE Information Report J387 *Terminology—Motor Vehicle Lighting* NOV 87, applies to that term as used in J586c and J588e.

* * * * *

Issued on May 31, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 26343
June 7, 1991

MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, and Motorcycles

(Docket No. 69-18)

S1. Scope. This standard specifies requirements for original and replacement lamps, reflective devices, and associated equipment.

S2. Purpose. The purpose of this standard is to reduce traffic accidents and deaths and injuries resulting from traffic accidents, by providing adequate illumination of the roadway, and by enhancing the conspicuity of motor vehicles on the public roads so that their presence is perceived and their signals understood, both in daylight and in darkness or other conditions of reduced visibility.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers (except pole trailers and trailer converter dollies), and motorcycles, and to lamps, reflective devices, and associated equipment for replacement of like equipment on vehicles to which this standard applies.

S4. Definitions. "Aiming Reference Plane" means a plane which is perpendicular to the longitudinal axis of the vehicle and tangent to the forwardmost aiming pad on the headlamp.

"Beam contributor" means an indivisible optical assembly including and lens, reflector, and light source, that is part of an integral beam headlighting system and contributes only a portion of a headlamp beam.

"Direct reading indicator" means a device that is mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, is part of a VHAD, and provides information about headlamp aim in an analog or digital format.

["Effective projected luminous lens area" means that area of the projection on a plane perpendicular to the lamp axis of the portion of the light-emitting surface that directs light to the photometric test pattern, and does not include mounting hole bosses, reflex reflector area, beads or rims that may glow or produce small areas of increased intensity as a result of uncontrolled light from small areas (½ deg. radius around the test point). **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

"Flash" means a cycle of activation and deactivation of a lamp by automatic means, continuing until stopped either automatically or manually.

"Headlamp test fixture" means a device designed to support a headlamp or headlamp assembly in the test position specified in the laboratory tests and whose mounting hardware and components are those necessary to operate the headlamp as installed in a motor vehicle.

"Integral Beam Headlamp" means a headlamp comprising an integral and indivisible optical assembly including lens, reflector, and light source, that is neither a standardized sealed beam headlamp designed to conform to paragraph S7.3 nor a replaceable bulb headlamp designed to conform to paragraph S7.5.

["Multiple compartment lamp" means a device which gives its indication by two or more separately lighted areas which are joined by one or more common parts, such as a housing or lens. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

["Multiple lamp arrangement" means an array of two or more separate lamps on each side of the vehicle which operate together to give a signal. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

["Remote reading indicator" means a device that is not mounted in its entirety on a headlamp or headlamp aiming or headlamp mounting equipment, but otherwise meets the definition of a direct reading indicator.

"Replaceable bulb headlamp" means a headlamp comprising a bonded lens and reflector assembly and one or two standardized replaceable light sources.

"Seasoning" means a process of energizing the filament of a headlamp, at design voltage, for a period of time equal to 1 percent of average rated laboratory life.

"Standardized replaceable light source" means an assembly of a capsule, base, and terminals, that meets the requirements of S7.6.

【"Vehicle headlamp aiming device" or "VHAD" means motor vehicle equipment permanently installed on a motor vehicle by the manufacturer of the vehicle, which is used for determining the horizontal and vertical aim of headlamps.

S5. Requirements.

S5.1 Required motor vehicle lighting equipment.

S5.1.1 Except as provided in succeeding paragraphs of S5.1.1, each vehicle shall be equipped with at least the number of lamps, reflective devices, and associated equipment specified in Tables I and III and S7, as applicable. Required equipment shall be designed to conform to the SAE Standards or Recommended Practices referenced in those tables. Table I applies to multipurpose passenger vehicles, trucks, trailers, and buses, 80 or more inches in overall width. Table III applies to passenger cars and motorcycles and to multipurpose passenger vehicles, trucks, trailers, and buses, less than 80 inches in overall width.

S5.1.1.1 A truck tractor need not be equipped with turn-signal lamps mounted on the rear if the turn signal lamps at or near the front are so constructed (double-faced) and so located that they meet the requirements for double-faced turn signals specified in SAE Standard J588e, *Turn Signal Lamps,* September 1970.

S5.1.1.2 A truck tractor need not be equipped with any rear side marker devices, rear clearance lamps, and rear identification lamps.

S5.1.1.3 Intermediate side marker devices are not required on vehicle less than 30 feet in overall length.

S5.1.1.4 Relective material conforming to Federal Specification L–S–300, *Sheeting and Tape, Refective; Non-exposed Lens, Adhesive Backing,* September 7, 1965, may be used for side reflex reflectors if this material, as used on the vehicle, meets the performance standards in either Table I or Table IA of SAE Standard J594f, *Reflex Reflectors,* January 1977.

S5.1.1.5 The turn signal operating unit on each passenger car and multipurpose passenger vehicle, truck, and bus less than 80 inches in overall width shall be self-canceling by steering wheel rotation and capable of cancellation by a manually operated control.

S5.1.1.6 【(a)】 Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586b *Stop Lamps,* June 1966, may also be designed to conform to J586b. It shall meet the photometric minimum candlepower requirements for Class A red turn signal lamps specified in SAE Standard J575d, *Tests for Motor Vehicle Lighting Devices and Components,* August 1967. Each such lamp manufactured for use on a passenger car and on a multipurpose passenger vehicle, truck, trailer, or bus less than 80 inches in overall width shall have an effective projected luminous area not less than 3½ square inches. If multiple compartment lamps or multiple lamps are used, the effective projected luminous area of each compartment or lamp shall be not less than 3½ square inches; however, the photometric requirements may be met by a combination of compartments or lamps.

【(b) Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970, may also be designed to conform to J586c. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)**】

【(c) A multipurpose passenger vehicle, truck, bus, or trailer whose overall width is 80 inches or more, manufactured on or before November 30, 1991, and whose stop lamps are located more than 22 inches apart, may be equipped with stop lamps designed to conform to SAE Standard J586c, *Stop Lamps,* August 1970." **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)**】

S5.1.1.7 (a) Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588d *Turn Signal Lamps,* June 1966, may also be designed to conform to J588d, and shall meet the photometric minimum candlepower requirements for Class A turn signal lamps specified in SAE Standard J575d, *Tests for Motor Vehicle Lighting Devices and Components,* August 1967. Each such lamp manufactured for use on a passenger car and on a multipurpose passenger vehicle, truck, trailer or bus less than 80 inches in overall width shall have an effective projected luminous area not less than

3½ square inches. If multiple compartment lamps or multiple lamps are used, the effective projected luminous area of each compartment or lamp shall be not less than 3½ square inches; however, the photometric requirements may be met by a combination of compartments or lamps. Each such lamp manufactured for use on a multipurpose passenger vehicle, truck, trailer or bus 80 inches or more in overall width shall have an effective projected luminous area not less than 12 square inches.

[(b) Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588e, *Turn Signal Lamps*, September 1970, may also be designed to conform to SAE Standard J588e. Note 6 of Table 1 of SAE Standard J588e does not apply. A stop lamp that is not optically combined with a turn signal lamp shall remain activated when the turn signal is flashing. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

[(c) A multipurpose passenger vehicle, truck, bus, or trailer, whose overall width is 80 inches or greater, manufactured on or before November 30, 1991, and whose turn signal lamps are located more than 22 inches apart, may be equipped with turn signal lamps designed to conform to SAE Standard J588e, *Turn Signal Lamps*, September 1970. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

S5.1.1.8 For each motor vehicle less than 30 feet in overall length, the photometric-minimum candlepower requirements for side marker lamps specified in SAE Standard J592e, *Clearance, Side Marker, and Identification Lamps*, July 1972, may be met for all inboard test points at a distance of 15 feet from the vehicle and on a vertical plane that is perpendicular to the longitudinal axis of the vehicle and located midway between the front and rear side marker lamps.

S5.1.1.9 A boat trailer whose overall width is 80 inches or more need not be equipped with both front and rear clearance lamps provided an amber (to front) and red (to rear) clearance lamp is located at or near the midpoint on each side so as to indicate its extreme width.

S5.1.1.10 Multiple license plate lamps and backup lamps may be used to fulfill the requirements of the SAE Standards applicable to such lamps referenced in Tables I and III.

S5.1.1.11 [A parking lamp, tail lamp, stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586c, *Stop Lamps*, August 1970, or turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588e, *Turn Signal Lamps*, September 1970, shall meet the minium percentage specified in Figure 1a of the corresponding minimum allowable value specified in Table 1 and Table 3 of SAE J588 NOV84 *Turn Signal Lamps*. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

Test points (deg)		*Turn signal*	*Stop*	*Parking*	*Tail*
10U, 10D	5L, 5R	20	20	20	20
5U, 5D	20L, 20R	12.5	12.5	10	15
	10L, 10R	37.5	37.5	20	40
	V	87.5	87.5	70	90
H	10L, 10R	50	50	35	40
	5L, 5R	100	100	90	100
	V	100	100	100	100

FIGURE 1a.—Required percentages of minimum candlepower of Figure 1b.

NOTE.—Minimum design candlepower requirements are determined by multiplying the percentages given in this Figure by the minimum allowable candlepower values in Figure 1b. The resulting values shall be truncated after one digit to the right of the decimal point.

Lamp	*Lighted Sections* 1	2	3
Stop	80/300	95/360	110/420
Tail[1]	2/18	3.5/20	5.0/25
Parking[2]	4.0/125	......	......
Red turn signal	80/300	95/360	110/420
Yellow turn signal rear	130/750	150/900	175/1050
Yellow turn signal front	200/ -	240/ -	275/ -
Yellow turn signal front[3]	500/ -	600/ -	685/ -

FIGURE 1b.—Minimum and maximum allowable candlepower values.

[1] Maximum at H or above.

[2] The maximum candlepower value of 125 applies to all test points at H or above. The maximum allowable candlepower value below H is 250.

[3] Values apply when the optical axis (filament center) of the front-turn signal is at a spacing less than 4 inches (10 cm.) from the lighted edge of the headlamp unit providing the lower beam, or from the lighted edge of any additional lamp installed as original equipment and which supplements the lower beam.lower beam.

S5.1.1.12 [A parking lamp, tail lamp, stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586c *Stop Lamps*, August 1970, or turn signal lamp manufactured to replace a turn signal lamp designated to conform to the SAE Standard J588e, *Turn Signal Lamps*, September 1970, is not required to meet the minimum photometric value at each test point specified in this standard if the sum of the percentages of the minimum candlepower measured at the test points is not less than that specified for each group listed in Figure 1c. **(55 F.R. 20158—May 15, 1990. Effective: December 1, 1990)]**

Groups and test points	*Turn signal*	*Stop*	*Parking*	*Tail*
10U–5L, 5U–20L, 5D–20L, 10D–5L	65	65	60	70
5U–10L, H–10L, 5D–10L .	125	125	75	120
H–5L, 5U–V, H–V, 5D–V, H–5R	475	475	420	480
5U–10R, H–10R, 5D–10R .	125	125	75	120
10U–5R, 5U–20R, 5D–20R, 10D–5R	65	65	60	70

FIGURE 1c.—Sum of the percentages of grouped minimum candlepower.

S5.1.1.13 Each passenger car, and each multipurpose passenger vehicle, truck, and bus of less than 80 inches overall width, shall be equipped with a turn signal operating unit designed to complete a durability test of 100,000 cycles.

S5.1.1.14 A trailer that is less than 30 inches in overall width may be equipped with only one tail lamp, stop lamp, and rear reflex reflector, which shall be located at or near its vertical centerline.

S5.1.1.15 A trailer that is less than 6 feet in overall length, including the tongue, need not be equipped with front side marker lamps and front side reflex reflectors.

S5.1.1.16 A lamp designed to use a type of bulb that has not been assigned a mean spherical candlepower rating by its manufacturer and is not listed in SAE Standard J 573d, *Lamp Bulbs and Sealed Units*, December 1986, shall meet the applicable requirements of this standard when used with any bulb of the type specified by the lamp manufacturer, operated at the bulb's design voltage. A lamp that contains a sealed-in bulb shall meet these requirements with the bulb operated at the bulb's design voltage.

S5.1.1.17 Except for a lamp having a sealed-in bulb, a lamp shall meet the applicable requirements of this standard when tested with a bulb whose filament is positioned within ±.010 inch of the nominal design position specified in SAE Standard J573d, *Lamp Bulbs and Sealed Units*, December 1968, or specified by the bulb manufacturer.

S5.1.1.18 A backup lamp is not required to meet the minimum photometric values at each test point specified in Table I of SAE Standard J593c, *Backup Lamps*, February 1968 if the sum of the candlepower measured at the test points within each group listed in Figure 2 is not less than the group totals specified in that figure.

(a) Each headlamp system, other than a headlamp system designed to conform to paragraph S7.5, that is designed to use such external aiming devices shall not deviate more than 0.30 degree when a downward torque of 20lb.-in. (2.25 N-m) is applied to the headlamp in its normal operating position, through the lamp's mechanical axis at the plane of the forwardmost aiming pad. Each headlamp system that is designed to conform to paragraph S7.5 and that is designed to use such external aiming devices, and which is manufactured on or after September 1, 1990, shall comply with this paragraph.

S5.1.1.19 Each variable load turn signal flasher shall comply with voltage drop and durability requirements of SAE Standard J590b, *Turn Signal Flasher*, October 1965 with the maximum design load connected, and shall comply with starting time, flash rate, and percent current "on" time requirements of J590b both with the minimum and with the maximum design load connected.

S5.1.1.20 The lowest voltage drop for turn signal flashers and hazard warning signal flashers measured between the input and load terminals shall not exceed 0.8 volt.

S5.1.1.21 A motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps.

S5.1.1.22 A motor-driven cycle whose speed attainable in 1 mile is 30 mph or less may be equipped with a stop lamp whose effective projected

luminous lens area is not less than 3½ square inches and whose photometric output for the groups of test points specified in Figure 1 is at least one-half of the minimum values set forth in that figure.

S5.1.1.23 Each tail lamp manufactured to replace the tail lamp designed to conform to SAE Standard J585d, *Tail Lamps*, August 1970, may also be designed to conform to J585d.

S5.1.1.24 Each turn signal lamp manufactured to replace a turn signal lamp (on a motorcycle) that was designed to conform to SAE Standard J588d, *Turn Signal Lamps*, June 1966, may also be designed to conform to J588d.

S5.1.1.25 Each turn signal lamp on a motorcycle manufactured on and after January 1, 1973, shall have an effective projected luminous area of not less than 3½ square inches.

S5.1.1.26 Note 6 of Table 1 in SAE Standard J588e, *Turn Signal Lamps*, September 1970, does not apply. [A stop lamp that is not optically combined, as defined by SAE Information Report J387 *Terminology—Motor Vehicle Lighting* NOV 87, with a turn signal lamp shall remain activated when the turn signal is flashing. **(56 F.R. 26343—June 7, 1991. Effective: July 8, 1991)]**

S5.1.1.27 (a) Except as provided in paragraph (b) of this section, each passenger car manufactured on or after September 1, 1985, and each multipurpose passenger vehicle, truck, and bus, whose overall width is less than 80 inches, whose GVWR is 10,000 pounds or less, manufactured on or after September 1, 1993, shall be equipped with a high-mounted stop lamp which:

(1) Shall have an effective projected luminous area not less than 4½ square inches.

(2) Shall have a signal visible to the rear through a horizontal angle from 45 degrees to the left to 45 degrees to the right of the longitudinal axis of the vehicle.

(3) Shall have the minimum photometric values in the amount and location listed in Figure 10.

(4) Need not meet the requirements of paragraphs 3.1.6 Moisture Test, 3.1.7 Dust Test, and 3.1.8 Corrosion Test of SAE Recommended Practice J186a if it is mounted inside the vehicle.

(5) Shall provide access for convenient replacement of the bulb without the use of special tools.

(b) Each multipurpose passenger vehicle, truck, and bus whose overall width is less than 80 inches, whose GVWR is 10,000 pounds or less, whose vertical centerline, when the vehicle is viewed from the rear, is not located on a fixed body panel but separates one or two movable body sections, such as doors, which lacks sufficient space to install a single high-mounted stop lamp on the centerline above such body sections, and which is manufactured on or after September 1, 1993, shall have two high-mounted stop lamps which:

(1) Are identical in size and shape and have an effective projected luminous area not less than 2¼ inches each.

(2) Together have a signal to the rear visible as specified in paragraph (a)(2) of this section.

(3) Together have the minimum photometric values specified in paragraph (a)(3) of this section.

(4) Shall provide access for convenient replacement of the bulbs without special tools. *(56 F.R. 16015—April 19, 1991. Effective: Optional compliance September 1, 1992. Mandatory compliance September 1, 1993)*

[**S5.1.1.28** A multipurpose passenger vehicle, truck, or bus, whose overall width is less than 80 inches, and whose GVWR is 10,000 pounds or less, that is manufactured between September 1, 1992 and September 1, 1993, may be equipped with a high-mounted stop lamp or, in the case of vehicles subject to S5.1.1.27(b), two high-mounted stop lamps, that conform to S5.1.1.27 and S5.3.1.8. *(56 F.R. 16015—April 19, 1991. Effective: Optional compliance September 1, 1992. Mandatory compliance September 1, 1993)*

S5.1.1.29 Instead of the headlamps specified by Table III, a motorcycle may be equipped with one half of any headlighting system specified in S7 which provides both a full upper beam and full lower beam, and where more than one lamp must be used, the lamps shall be mounted vertically, with the lower beam as high as practicable. When installed on a motorcycle such half system need not meet the aiming requirements specified in S7.

S5.1.1.30 Each replaceable bulb headlamp that is designed to meet the photometric requirements of SAE Recommended Practice J584, *Motorcycle Headlamps*, April 1964, and that is equipped with a light source other than a standardized replaceable light source, and that is manufactured on or after September 1, 1990 shall have the word "motorcycle" permanently marked on the lens in characters not less than 0.114 inch (3mm) in height.

S5.1.1.31 On a motor vehicle whose overall width is less than 80 inches:

(a) The functional lighted lens area of a single compartment stop lamp, and a single compartment rear turn signal lamp, shall be not less than 50 square centimeters.

(b) If a multiple compartment lamp or multiple lamps are used to meet the photometric requirements for stop lamps and rear turn signal lamps, the functional lighted lens area of each compartment or lamp shall be at least 22 square centimeters, provided the combined area is at least 50 square centimeters.

S5.1.1.32 On a motor vehicle, except a passenger car, whose overall width is 80 inches or more, measurements of the functional lighted lins area, and of the photometrics, of a multiple compartment stop lamp, and a multiple compartment turn signal lamp, shall be made for the entire lamp and not for the individual compartments.

S5.1.2 Plastic materials used for optical parts such as lenses and reflectors shall conform to SAE *Recommended Practice* J576c, May 1970, except that:

(a) Plastic lenses used for inner lenses or those covered by another material and not exposed directly to sunlight shall meet the requirements of paragraphs 3.4 and 4.2 of SAE J576c, when covered by the outer lens or other material;

(b) After the outdoor-exposure test, the haze and loss of surface luster of plastic materials used for lamp lenses shall not be greater than 30 percent haze as measured by ASTM-1003-61, *Haze and Luminous Transmittance of Transparent Plastic*; and

(c) After the outdoor exposure test, plastic materials used for reflex reflectors shall meet the appearance requirements of paragraph 4.2.2 of SAE J576c.

S5.1.3 No additional lamp, reflective device, or other motor vehicle equipment shall be installed that impairs the effectiveness of lighting equipment required by this standard.

S5.1.4 Each school bus shall be equipped with a system of either:

(a) Four red signal lamps designed to conform to SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, and installed in accordance with that standard; or

(b) Four red signal lamps designed to conform to SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, and four amber signal lamps designed to conform to that standard, except for their color, and except that their candlepower shall be at least 2½ times that specified for red signal lamps. Both red and amber lamps shall be installed in accordance with SAE Standard J887, except that:

(i) Each amber signal lamp shall be located near each red signal lamp, at the same level, but closer to the vertical centerline of the bus; and

(ii) The system shall be wired so that the amber signal lamps are activated only by manual or foot operation, and if activated, are automatically deactivated and the red signal lamps automatically activated when the bus entrance door is opened.

S5.1.5 The color in all lamps, reflective devices, and associated equipment to which this standard applies shall comply with SAE Standard J578c, *Color Specification for Electric Signal Lighting Devices,* February 1977.

S5.2. Other requirements.

S5.2.1. The words "it is recommended that," "recommendations," or "should be" appearing in any SAE Standard or Recommended Practice referenced or subreferenced in this standard shall be read as setting forth mandatory requirements, except that the aiming pads on the lens face and the black area surrounding the signal lamp, recommended in SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, are not required.

S5.2.2 The words "Type 1 (5¾")," "Type 2 (5¾")," "Type 2 (7")," "Type 1A," "Type 2A," and "Type 2B" appearing in any SAE Standard or Recommended Practice referenced or subreferenced in this standard shall also be read as setting forth requirements respectively for the following types of headlamps: 1C1, 2C1, 2D1, 1A1, 2A1, and 2B1.

S5.3. Location of required equipment.

5.3.1 Except as provided in succeeding paragraphs of S5.3.1 [and S7] each lamp, reflective device, and item of associated equipment shall be securely mounted on a rigid part of the vehicle other than glazing that is not designed to be removed except for repair, in accordance with the requirements of Tables I or III [as applicable, and S7, and in the location] specified in Table II (multipurpose passenger vehicles, trucks, trailers, and buses 80 or more inches in overall width) and Table IV (all passenger cars, and motorcycles, and multipurpose passenger vehicles, trucks, trailers, and buses less than 80 inches in overall width), as applicable. **(54 F.R. 30223—July 19, 1989. Effective: July 19, 1989)**

S5.3.1.1 Except as provided in S5.3.1.1.1, each lamp and reflective device shall be located so that it meets the visibility requirements specified in any applicable SAE Standard or Recommended Practice. In addition, no part of the vehicle shall prevent a parking lamp, taillamp, stop lamp, turn-signal lamp, or backup lamp from meeting its photometric output at any applicable group of test points specified in Figures 1c and 2, or prevent any other lamp from meeting the photometric output at any test point specified in any applicable SAE Standard or Recommended Practice. However, if motor vehicle equipment (e.g., mirrors, snow plows, wrecker booms, backhoes, and winches) prevents compliance with this paragraph by any required lamp or reflective devices, an auxiliary lamp or device meeting the requirements of this paragraph shall be provided.

S5.3.1.1.1 Clearance lamps may be mounted at a location other than on the front and rear if necessary to indicate the overall width of a vehicle, or for protection from damage during normal operation of the vehicle, and at such a location they need not be visible at 45 degrees inboard.

S5.3.1.2 On a truck tractor, the red rear reflex reflectors may be mounted on the back of the cab, at a minimum height not less than 4 inches above the height of the rear tires.

S5.3.1.3 On a trailer, the amber front side reflex reflectors and amber front side-marker lamps may be located as far forward as practicable exclusive of the trailer tongue.

S5.3.1.4 When the rear identification lamps are mounted at the extreme height of a vehicle, rear clearance lamps need not meet the requirement of Table II that they be located as close as practicable to the top of the vehicle.

S5.3.1.5 The center of the lens referred to in SAE Standard J593c, *Backup Lamps,* February 1968, is the optical center.

S5.3.1.6 On a truck tractor, clearance lamps mounted on the cab may be located to indicate the width of the cab, rather than the overall width of the vehicle.

S5.3.1.7 On a motor vehicle on which the front turn signal lamp is less than 100 mm from the lighted edge of a lower beam headlamp, as measured from the optical center of the turn signal lamp, the multiplier applied to obtain the required minimum luminous intensities shall be 2.5.

S5.3.1.8 [(a) Each high-mounted stop lamp installed in or on a vehicle subject to S5.1.1.27(a) shall be located as follows:

(1) With its center at any place on the vertical centerline of the vehicle, including the glazing, as the vehicle is viewed from the rear.

(2) If the lamp is mounted below the rear window, no portion of the lens shall be lower than 6 inches below the rear window on convertibles, or 3 inches on other passenger cars.

(3) If the lamp is mounted inside the vehicle, means shall be provided to minimize reflections from the light of the lamp upon the rear window glazing that might be visible to the driver when viewed directly, or indirectly in the rearview mirror.

(b) The high-mounted stop lamps installed in or on a vehicle subject to S5.1.1.27(b) shall be located at the same height, with one vertical edge of each lamp on the vertical edge of the body section nearest the vertical centerline.

(6) In the second column Table III for the item "High-mounted stop lamp", the text "1 red, for passenger cars only" is revised to read "1 red".

(7) In the second column of Table IV for the item "High-mounted stop lamp", the text "On the rear, on the vertical centerline (See S4.3.1.8), effective September 1, 1985, for passenger cars only" is revised to read "On the rear, on the vertical centerline (See S5.1.1.27, S5.3.1.8, and Table III)."

(8) In the fourth column of Table IV for the item "High-mounted stop lamp", the text "(See S4.3.1.8)" is revised to read "See S5.3.1.8 for passenger cars. Not less than 34 inches for multipurpose passenger vehicles, trucks, and buses." **(56 F.R. 16015—April 19, 1991. Effective: Optional compliance September 1, 1992. Mandatory compliance September 1, 1993)]**

S5.4 Equipment combinations. [Two or more lamps, reflective devices, or items of associated equipment may be combined if the requirements for each lamp, reflective device, and item of associated equipment are met, except that no clearance lamp may be optically, as defined by SAE Information Report J387 *Terminology-Motor Vehicle Lighting* NOV 87, with any taillamp, and no high-mounted stop lamp shall be combined with any other lamp or reflective device. **(56 F.R. 26343—June 7, 1991. Effective: July 8, 1991)]**

S5.4.1. [Removed]

(55 F.R. 46669 November 6, 1990)

S5.5. Special wiring requirements.

S5.5.1. Each vehicle shall have a means of switching between lower and upper beams that conforms to SAE Recommended Practice J564a, *Headlamp Beam Switching,* April 1964, or to SAE Recommended Practice J565b, *Semi-Automatic Headlamp Beam Switching Devices,* February 1969. Except as provided in S5.5.8, the lower and upper beams shall not be energized simultaneously except momentarily for temporary signalling purposes or during switching between beams.

S5.5.2 Each vehicle shall have a means for indicating to the driver when the upper beams of the headlamps are on that conforms to SAE Recommended Practice J564a, April 1964, except that the signal color need not be red.

S5.5.3 The taillamps on each vehicle shall be activated when the headlamps are activated in a steady-burning state.

S5.5.4 The stoplamps on each vehicle shall be activated upon application of the service brakes. The high-mounted stoplamp on each passenger car shall be activated only upon application of the service brakes.

S5.5.5 The vehicular-hazard warning-signal operating unit on each vehicle shall operate independently of the ignition or equivalent switch, and when activated, shall cause to flash simultaneously sufficient turn signal lamps to meet, as a minimum, the turn signal lamp photometric requirements of this standard.

S5.5.6 Each vehicle equipped with a turn signal operating unit shall also have an illuminated pilot indicator. Failure of one or more turn signal lamps to operate shall be indicated in accordance with SAE Standard J588e, *Turn Signal Lamps,* September 1970, except when a variable-load turn signal flasher is used on a truck, bus, or multipurpose passenger vehicle 80 or more inches in overall width, on a truck that is capable of accommodating a slide-in camper, or on any vehicle equipped to tow trailers.

S5.5.7. On each passenger car, and motorcycle, and multipurpose passenger vehicle, truck, and bus of less than 80 inches overall width:

(a) When the parking lamps are activated, the taillamps, license plate lamps, and side marker lamps shall also be activated; and

(b) When the headlamps are activated in a steady-burning state, the taillamps, parking lamps, license plate lamps and side marker lamps shall also be activated.

S5.5.8. On a motor vehicle equipped with a headlighting system designed to conform to the photometric requirements of Figure 15, the lamps marked "L" or "LF" may be wired to remain permanently activated when the lamps marked "U" or "LF" are activated. On a motor equipped with an Integral Beam headlighting system meeting the photometric requirements of section S7.4(a)(1)(ii), the lower beam headlamps shall be wired to remain permanently activated when the upper beam headlamps are activated.

S5.5.9. [Except as provided in Section S5.5.8, the wiring harness or connector assembly of each headlamp system shall be designed so that only those light sources intended for meeting lower beam photometrics are energized when the beam selector switch is in the lower beam position, and that only those light sources intended for meeting upper beam photometrics are energized when the beam selector switch is in the upper beam position. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

S5.5.10. The wiring requirements for lighting equipment in use are:

(a) Turn signal lamps, hazard warning signal lamps, and school bus warning lamps shall be wired to flash;

[(b)] Headlamps and side-marker lamps may be wired to flash for signalling purposes;

[(c)] A motorcycle headlamp may be wired to allow either its upper beam or its lower beam, but not both, to modulate from a higher intensity to a lower intensity in accordance with Section S4.6;

[(d)] All other lamps shall be wired to be steady-burning. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

S5.6. Motorcycle headlamp modulation system.

S5.6.1. A headlamp on a motorcycle may be wired to modulate either the upper beam or the lower beam from its maximum intensity to a lesser intensity provided that:

(a) The rate of modulation shall be 240 ± 40 cycles per minute.

(b) The headlamp shal be operated at maximum power for 50 to 70 percent of each cycle.

(c) The lowest intensity at any test point shall be not less than 17 percent of the maximum intensity measured at the same point.

(d) The modulator switch shall be wired in the power lead of the beam filament being modulated and not in the ground side of the circuit.

(e) Means shall be provided so that both the lower beam and upper beam remain operable in the event of a modulator failure.

(f) The system shall include a sensor mounted with the axis of its sensing element perpendicular to a horizontal plane. Headlamp modulation shall cease whenever the level of light emitted by a tungsten filament light operating at 3000° Kelvin is either less than 270 lux (25 footcandles) of direct light for upward pointing sensors or less than 60 lux (5.6 footcandles) of reflected light for downward pointing sensors. The light is measured by a silicon cell type light meter that is located at the sensor and pointing in the same direction as the sensor. A Kodak Gray Card (Kodak R-27) is placed at ground level to simulate the road surface in testing downward-pointing sensors.

(g) When tested in accordance with the test profile shown in Figure 9, the voltage drop across the modulator when the lamp is on at all test conditions for 12-volt systems and 6-volt systems shall not be greater than .45 volt. The modulator shall meet all the provisions of the standard after completion of the test profile shown in Figure 9.

(h) Means shall be provided so that both the lower and upper beam function at design voltage when the headlamp control switch is in either the lower or upper beam position when the modulator is off.

S5.6.2. (a) Each motorcycle headlamp modulator not intended as original equipment, or its container, shall be labeled with the maximum wattage, and the minimum wattage, appropriate for its use. Additionally, each such modulator shall comply with S5.6.1 (a) through (g) when connected to a headlamp of the maximum rated power and a headlamp of the minimum rated power and shall provide means so that the modulated beam functions at design voltage when the modulator is off.

(b) Instructions, with a diagram, shall be provided for mounting the light sensor including location on the motorcycle, distance above the road surface, and orientation with respect to the light.

S5.7. Replacement equipment.

S5.7.1. Each lamp, reflective device, or item of associated equipment manufactured to replace any lamp, reflective device, or item of associated equipment on any vehicle to which this standard applies, shall be designed to conform with this standard.

S5.7.2. Unless otherwise specified in this standard, each lamp, reflective device, or item of associated equipment to which section S5.7.1 applies may be labeled with the symbol DOT, which shall constitute a certification that it conforms to applicable Federal motor vehicle safety standards.

S6. Subreferenced SAE Standards and Recommended Practices.

S6.1. SAE Standards and Recommended Practices subreferenced by the SAE Standards and Recommended Practices included in Tables I and III and paragraphs S5.1.4 and S5.5.1 are those published in the 1970 edition of the SAE Handbook, except that the SAE standard referred to as "J575" is J575e, *Tests for Motor Vehicle Lighting Devices and Components,* August 1970, for stoplamps, designed to conform to SAE Standards J586c, J586 FEB84, and J1398 MAY85; for taillamps designed to conform to SAE Standards J585d and J585e; for turn signal lamps designed to conform to SAE Standards J588e, J588 NOV84, and J1395 APR85; and for high-mounted stoplamps designed to conform to SAE Recommended Practice J186a. The reference in J585e to J256 does not apply. For headlamps, unless otherwise specified in this standard, the version of SAE Standard J575 is DEC 88, and the version of SAE Standard J602 is OCT 80. [The definition of "optically combined" in SAE Information Report J387 *Terminology-Motor Vehicle Lighting* NOV 87, applies to that term as used in J586c and J588e. **(56 F.R. 26343—June 7, 1991. Effective: July 8, 1991)**]

S6.2. Requirements of SAE Standards incorporated by reference in this standard, other than J576b and J576c, do not include tests for warpage of devices with plastic lenses.

S6.3. The term "effective projected luminous lens area" has the same meaning as the term "functional lighted lens area" in any SAE Standard or Recommended Practice incorporated by reference or by subreference in this standard.

S7. Headlighting requirements.

S7.1. Each passenger car, multipurpose passenger vehicle, truck, and bus shall be equipped with a headlighting system designed to conform to the requirements of S7.3, S7.4, or S7.5.

S7.2. (a) The lens of each original and replacement equipment headlamp, and of each original equipment and replacement equipment beam contributor manufactured on or after December 1, 1989, shall be marked with the symbol "DOT," either horizontally or vertically which shall constitute the certification required by 15 U.S.C. 1403.

(b) The lens of each headlamp and of each beam contributor manufactured on or after December 1, 1989, to which paragraph (a) of this section applies shall be marked with the name and/or trademark registered with the U.S. Patent and Trademark Office of the manufacturer of such headlamp or beam contributor, or its importer, or any manufacturer of a vehicle equipped with such headlamp or beam contributor. Nothing in this paragraph shall be construed to authorize the marking of any such name and/or trademark by one who is not the owner, unless the owner has consented to it.

(c) Each headlamp and beam contributor to which paragraph (a) of this section applies shall be marked with its voltage and with its part or trade number.

S7.3 Sealed beam headlighting system. A sealed beam headlighting system shall be designed to meet the requirements of one of the following subparagraphs of S7.3.2 through S7.3.9. In references to Figures in SAE J1383 APR 85 for headlamp dimensional requirements, only those dimensions marked "I" for interchangeability are applicable.

S7.3.1 The lens of each sealed beam headlamp designed to conform to S7.3.2 through S7.3.6 shall be marked according to paragraph 5.4.3 through 5.4.5 of SAE Standard J1383 April 85 *Performance Requirements for Motor Vehicle Headlamps*.

S7.3.2 Type A headlighting system. A Type A headlighting system consists of two Type 1A1 and two Type 2A1 headlamps and associated hardware, which are designed to conform to the following requirements:

(a) SAE Standard J1383 APR 85 *Performance Requirements for Motor Vehicle Headlamps*, with the following exceptions:

(1) Paragraphs 1, 2.1.2, 2.8.2, 3, 4.1.1, 4.1.2, 4.1.3, 4.4, 4.6, 4.8 through 4.18, 5.1.1, 5.1.3, 5.1.5, 5.1.7 through 5.1.16, 5.2.2, 5.3.5, 5.4.1, 5.4.2, and 6 through 6.4 do not apply.

(2) In paragraph 5.3.2, the words "and retaining rings" are omitted.

(3) In paragraphs 4.5.2 and 5.1.6, the words "either Table 1 or Table 2 of SAE J579 DEC 84 as appropriate" are substituted for "Table 3."

(b) SAE Standard J580 DEC 86 *Sealed Beam Headlamp Assembly* (except paragraphs 3, 4.1.1, 5.1.1.1, 5.1.2.3, and the second sentence of 5.1.6); in 5.2.1, delete the words "and retaining rings;" the correct reference is SAE J1383 Figure 6, 9, 12 and 14.

(c) After a vibration test conducted in accordance with paragraph S8.8, there shall be no evidence of loose or broken parts, other than filaments, visible without magnification.

(d) The maximum wattage at 12.8 volts (design voltage): Single filament headlamp, 55 watts on the upper beam; dual filament headlamp, 43 watts on the upper beam and 65 watts on the lower beam.

S7.3.3 Type B headlighting system. A Type B headlighting system consists of two Type 2B1 headlamps and associated hardware, which are designed to conform to the following requirements:

(a) The requirements of paragraphs S7.3.2(a) through (c).

(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on the upper beam and 60 watts on the lower beam.

S7.3.4 Type C headlighting system. A Type C headlighting system consists of two Type 1C1 and two Type 2C1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2(a) through (d).

S7.3.5 Type D headlighting system. (a) A Type D headlighting system consists of two Type 2D1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2(a) through (c).

[(b) The maximum wattage at 12.8 volts (design voltage): 65 watts on upper beam, and 55 watts on lower beam. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)**]

S7.3.6 Type E headlighting system. (a) A Type E headlighting system consists of two Type 2E1 headlamps and associated hardware, which are designed to conform to the requirements of paragraph S7.3.2(a) through (c).

[(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on upper beam, and 60 watts on lower beam. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)**]

S7.3.7 Type F headlighting system. A Type F headlighting system consists of two Type UF and

two Type LF headlamps and associated hardware, which are designed to conform to the following requirements:

(a) Figures 11, 12, 13, and 14 as appropriate.

(b) The photometric requirements of Figure 15 of this standard. A reaim tolerance of +/− ¼ degree is allowed for any test point on the Type LF lamp when tested alone, but is not allowed on the Type UF lamp when tested alone. For the test point 10U-90U, measurement shall be from the normally exposed surface of the lens face.

(c) SAE Standard J1383 APR 85 *Performance Requirements for Motor Vehicle Headlamps*, Sections 2.4, 2.5, 2.6, 4.1, 4.1.4 and [5.1.4].

(d) When tested in accordance with section (c), the mounted assembly (either Type UF or Type LF headlamps, respective mounting ring, aiming ring, and aim adjustment mechanism) shall be designed to conform to the requirements of Figure 15 for upper or lower beams respectively without reaim when any conforming Type UF or LF headlamp is tested and replaced by another conforming headlamp of the same Type.

(e) SAE J580 DEC 86 *Sealed Beam Headlamp Assembly* with the following exceptions:

(1) Section 2.2 Mounting Ring reads: "the adjustable ring upon which the sealed beam unit is mounted and which forces the sealed beam unit to seat against the aiming ring when assembled into a sealed beam assembly."

(2) The definition "2.3 Aiming Ring" reads: "The clamping ring that retains the sealed beam unit against the mounting ring, and that provides an interface between the unit's aiming/seating pads and the headlamp aimer adapter (locating plate)."

(3) Section 4.1.1 Vibration Test does not apply.

(4) Section 5.1.1.1 [and 5.1.2.3 do] not apply.

(5) Section 5.1.2.1 reads: "When the headlamp assembly is tested in the laboratory, a minimum aiming adjustment of +/− 2.5 degrees shall be provided in the horizontal plane and +/− 4 degrees in the vertical plane."

(6) Section 5.1.2.2 concludes:". . . through and angle of +/− 2.5 degrees and +/− 4 degrees respectively."

(7) Section 5.1.6 is retitled "Retaining Ring/Aiming Ring Tests." The phrase "92 x 150mm . . .0.340 in (8.6 mm)" is added at the end of the table for flange thickness. The sentence beginning 'The fastening means' is deleted. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

(8) Figures 2, 3, and 4 do not apply, and the reference to them in section 4.5 is replaced by "Figure 16, Deflectometer, of Federal Motor Vehicle Safety Standard No. 108."

(f) A lens for a Type F headlamp incorporating an upper beam shall be labeled "UF". A lens for a Type F headlamp incorporating a lower beam shall be labeled "LF". The face of letters, numbers, or other symbols molded on the surface of the lens shall not be raised more than 0.020 in (0.5 mm), and shall be placed no closer to the geometric center of the lens than 1.375 in (35 mm.). The marking shall be molded in the lens and shall be not less than ¼ in. (6.35 mm.) in size.

(g) The maximum wattage at 12.8 volts (design voltage): 70 watts on the upper beam and 60 watts on the lower beam.

(h) Type F headlamps may be mounted on common or parallel seating and aiming planes to permit simultaneous aiming of both headlamps provided that when tested with any co forming Type UF and LF headlamps according to Section S10:

(1) The assembly (consisting of the Type UF and LF headlamps, mounting rings, the aiming/seating rings, and aim adjustment mechanism), shall be designed to conform to the test point values of Figure 15.

(2) There shall be no provision for adjustment between the common or parallel aiming and seating planes of the two lamps.

(i) After a vibration test conducted in accordance with paragraph S8.8, the Type F system shall show no evidence of loose or broken parts, other than filaments, visible without magnification.

S7.3.8 Type G headlighting system. A Type G headlamp system consists of two Type 1G1 headlamps and two Type 2G1 headlamps each of which is designed to conform to the following requirements:

(a) Figures 18 and 21.

(b) SAE Standard J1383 APR 85 *Performance Requirements for Motor Vehicle Headlamps* (except paragraphs 1, 2.1.2, 2.8.2, 3, 4.1.1, 4.1.2, 4.1.3, 4.4, 4.6, 4.8 through 4.18, 5.1.1, 5.1.3, 5.1.5 through 5.1.16, 5.2.2, 5.3.5 through 6.4). In paragraph 5.3.2 the words "and retaining rings" are omitted. In paragraph 4.5.2, the words either Table 1 or Table 2 or SAE J579 DEC 84, as appropriate" are substituted for the words "Table 3."

(c) SAE Standard J580 DEC 86 *Sealed Beam Headlamp Assembly*, with the following exception:

(1) Sections 2.2, 2.3, 4.1.1, 5.1.1.1, 5.1.2.3, 5.1.6 and 5.2.1.

(2) Section 4.5 reads: "*Torque Deflection Test.* The headlamp assembly to be tested shall be mounted in the designed vehicle position and set at nominal aim (0.0). A special adapter (Figure 22) for the deflectometer (Figure 3) shall be clamped onto the headlamp assembly. A torque of 20 in.-lbs. (2.25 N-m) shall be applied to the headlamp assembly through the deflectometer, and a reading on the thumb wheel shall be taken. The torque shall be removed and a second reading on the thumb wheel shall be taken."

(d) After a vibration test conducted in accordance with paragraph S8.8, there shall be no evidence of loose or broken parts, other than filaments, visible without magnification.

(e) The maximum wattage at 12.8 volts (design voltage) for the 1G1 and 2G1 upper beam is 55 watts and 43 watts respectively; for the 2G1 lower beam, 65 watts.

(f) A lens for a Type G headlamp incorporating only part of an upper beam shall be labeled 1G1. A lens for a Type G headlamp incorporating both parts of an upper beam and a lower beam shall be labeled 2G1. The face of letters, numbers, or other symbols molded on the surface of the lens shall not be raised more than 0.020 in. (0.5 mm.), and shall be placed no closer to the geometric center of the lens than 1.375 in. (35 mm.). The marking shall be molded in the lens and shall be not less than ¼ in. (6.35 mm) in size.

S7.3.9 Type H headlighting system. A Type H headlamp system consisting of two Type 2H1 headlamps and associated hardware, which are designed to conform to the following requirements:

(a) Paragraph S7.3.8(a) through (d).

(b) The maximum wattage at 12.8 volts (design voltage): 70 watts on the upper beam and 60 watts on the lower beam.

(c) A lens for a Type H headlamp incorporating both an upper beam and a lower beam shall be labeled 2H1. The face of letters, numbers, or other symbols molded on the surface of the lens shall not be raised more than 0.020 in. (0.5 mm), and shall be placed no closer to the geometric center of the lens than 1.375 in. (35 mm.) The marking shall be molded in the lens and shall be not less than ¼ in. (6.35 mm) in size.

S7.4 Integral Beam Headlighting System. An integral beam headlighting system shall be designed to conform to the following requirements:

(a) The system shall provide in total not more than two upper beams and two lower beams of the performance described in one of the following:

(1) In a four-headlamp system, each upper beam headlamp and each lower beam headlamp shall be designed to conform to the photometrics of one of the following:

(i) Figure 15;

(ii) Figure 15 except that the upper beam test values at 2½ D-V and 2½ D-12R and 12L shall apply to the lower headlamp and not to the upper beam headlamp, and the upper beam test point value at 1½ D-9R and 9L shall be 1,000, or

(iii) Table 2 of SAE J579 DEC 84.

(2) In a two-headlamp system, each headlamp shall be designed to conform to the photometrics of one of the following:

(i) Figure 17; or

(ii) Table 1 of SAE J579 DEC 84.

(3) In a system in which there is more than one beam contributor providing a lower beam, and /or more than one beam contributor providing an upper beam, each beam contributor in the system shall be designed to meet only the photometric performance requirements of Figure 15 based upon the following mathematical expression: conforming test point value = 2 (Figure 15 test point value)/total number of lower or upper beam contributors for the vehicle, as appropriate. The system shall be designed to use the Vehicle Headlamp Aiming Device (VHAD) as specified in paragraph S7.7.5.2.

(b) The lower and upper beams shall be provided only as follows where each headlamp contains two light sources:

(1) The lower beam shall be provided either by the most outboard light source (or the uppermost if arranged vertically), or by all light sources.

(2) The upper beam shall be provided either by the most inboard light source (or the uppermost if arranged vertically), or by all light sources.

(c) The lower and upper beams shall be provided only as follows where each headlamp contains a signal light source.

(1) The lower beam shall be provided by the most outboard headlamps (or the uppermost if arranged vertically), and the lens of each such headlamp shall be permanently marked with the letter "L."

(2) The upper shall be provided by the most inboard headlamps (or lowermost if arranged vertically), and the lens of each such headlamp shall be permanently marked with the letter "U."

(d) A tolerance of +/− ¼ degree reaim tolerance during photometric performance tests is permitted for any headlamp. The test points 10U-90U shall be measured from the normally exposed surface of the lens face.

(e) A headlamp or beam contributor designed to meet paragraphs (a)(1) or (a)(3) of this section and S7.7.5.1 may be mounted in an assembly to permit simultaneous aiming of the beam(s) contributors, provided that with any complying contributor the assembly complete with all lamps meets the appropriate photometric requirements when tested in accordance with S10.

(f) Each integral beam headlamp system shall be designed to conform to the applicable photometric performance requirements in paragraph (a) of this section when tested in accordance with Sections 4.1 and 4.1.4 of SAE Standard J1383 APR 85 with any headlamp intended for use in such system. The term "aiming plane" means "aiming reference plane," or an appropriate vertical plane defined by the manufacturer as required in paragraph S7.7.1.

(g) The system shall be aimable in accordance with the requirements of paragraph S7.7. A system that incorporates any headlamp or beam contributor that does not have a VHAD as an integral and indivisible part of the headlamp or beam contributor shall be designed so that the appropriate photometrics are met when any correctly aimed and photometrically conforming headlamp or beam contributor is removed from its mounting and aiming mechanism, and is replaced without reaim by any conforming headlamp or beam contributor of the same type.

(h) A headlamp with a glass lens need not meet the abrasion resistance test (S8.2), or the chemical resistance test (S8.3), or impact (S8.8) tests. If, in addition to a glass lens, the headlamp uses a nonplastic reflector, it need not meet the internal heat test of paragraph S8.6.2. A headlamp of sealed design as verified in paragraph S8.9 *Sealing* need not meet the corrosion (S8.4), dust (S8.5), or humidity (S8.7) tests, however, the headlamp shall meet the requirements of paragraphs 4.1, 4.1.2, 4.4 and 5.1.4 for corrosion and connector of SAE Standard J580 DEC 86 *Sealed Beam Headlamp Assembly*.

(i) When tested according to any of the procedures indicated in subparagraphs (1) through (7) each headlamp or beam contributor shall meet the appropriate requirement:

(1) After an abrasion test conducted in accordance with paragraph S8.2, the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(2) After a chemical resistance test involving exposure to any of the fluids listed in paragraph S8.3, there shall be no surface deterioration, coating delamination, fractures, deterioration of bonding materials, color bleeding or color pickup visible without magnification, and the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(3) After a corrosion test conducted in accordance with paragraph S8.4 there shall be no evidence of external or internal corrosion or rust visible without magnification. Loss of adhesion of any applied coating shall not occur more than 0.125 in. (3.2 mm) from any sharp edge on the inside or outside. Corrosion may occur on terminals only if the current produced during the test of paragraph S8.4(c) is not less than 9.7 amperes.

(4) After a dust test conducted in accordance with paragraph S8.5, the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(5) The headlamp shall first meet the requirements of subparagraph (i) and then those of subparagraph (ii).

(i) After a temperature cycle test conducted in accordance with paragraph S8.6.1, the headlamp shall show no evidence of delamination, fractures, entry of moisture or deterioration of bonding material, color bleeding, warpage or deformation visible without magnification or lens warpage greater than .118 in (3 mm) when measured parallel to the optical axis at the point of intersection of the axis of each light source with the exterior surface of the lens, and its shall meet the photometric requirements applicable to the headlamp system under test.

(ii) After an internal heat test conducted in accordance with paragraph S8.6.2, there shall be no lens warpage greater than .118 in (3 mm) when measured parallel to the optical axis at the point of intersection of the axis of each light source with the exterior surface of the lens, and it shall meet the photometric requirements applicable to the headlamp system under test.

(6) After a humidity test conducted in accordance with paragraph S8.7, the inside of the headlamp shall show no evidence of delamination or moisture, fogging or condensation visible without magnification.

(7) After a vibration test conducted in accordance with paragraph S8.8, there shall be no evidence of loose or broken parts, other than filaments, visible without magnification.

S7.5 Replaceable Bulb Headlamp System.

Each replaceable bulb headlamp system shall be designed to conform to the following requirements:

(a) The system shall provide only two lower beams and two upper beams and shall incorporate not more than two standardized replaceable light sources in each headlamp.

(b) [The photometrics as specified in paragraphs (c) through (e) of this section (depicted in Figure 26), using any standardized light source of the Type intended for use in such system. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(c) [The test requirements of sections 4.1, 4.1.4, and performance requirements of section 5.1.4 of SAE J1383 April 85, using the photometric requirements specified in paragraphs (d) and (e) of this section.] The term "aiming plane" means "aiming reference plane," or an appropriate vertical plane defined by the manufacturer as required in paragraph S7.7.1. A ¼ degree reaim tolerance is permitted for any test point. The test points 10U-90U shall be measured from the normally exposed surface of the lens face. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(d) [For a headlamp system equipped with dual filament light sources, Type HB1 light sources, Type HB2 light sources, Type HB5 light sources, or Types HB1 and HB5 in combination, the following requirements apply:

(1) Headlamps designed to conform to the external aiming requirements of S7.7.5.1 shall have no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(2) The lower and upper beams of a headlamp system consisting of two lamps, each containing one or two light sources, shall be provided as follows:

(i) The lower beam shall be provided in one of the following ways:

(A) By the outboard light source (or upper one if arranged vertically) designed to conform to:

(1) the lower beam requirements of Figure 17, if the light sources are type HB2; or

(B) Both light sources, in the headlamp designed to conform to the lower beam requirements specified above for their Type.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to:

(1) the upper beam requirements of Table 1 of SAE Standard J579 DEC84, if the light sources are only Type HB1; or Type HB5, or a combination thereof; or

(2) the upper beam requirements of Figure 17, if the light sources are Type HB2; or

(B) By both light sources in the headlamp, designed to conform to the upper beam photometrics specified above for their type.

(3) The lower and upper beams of a headlamp system consisting of four lamps, each containing a single light source, shall be provided as follows:

(i) The lower beam shall be provided by the outboard lamp (or upper one if arranged vertically), designed to conform to:

(A) the lower beam requirements of Table 1 of SAE Standard J579 DEC 84, if the light sources are only Type HB1; or Type HB5, or a combination thereof; or

(B) the lower beam requirements of Figure 15, if the light sources are Type HB2. The lens of each such headlamp shall be marked with the letter "L."

(ii) The upper beam shall be provided by the inboard lamp (or the lower one if arranged vertically), designed to conform to:

(A) the upper beam requirements of Table 1 of SAE Standard J579 DEC 84, if the light sources are only Type HB1; or Type HB5, or a combination thereof; or

(B) the upper beam requirements of Figure 15, if the light sources are Type HB2. The lens of each such headlamp shall be marked with the letter "U."

(e) [The following requirements apply to a headlamp system equipped with any combination of light sources except those specified in paragraph (d) of this section: **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(1) There shall be no mechanism that allows adjustment of an individual light source, or, if there are two light sources, independent adjustment of each reflector.

(2) The lower and upper beams of a headlamp system consisting of two lamps, each containing two light sources [(other than those specified in paragraph (d) of this section)] shall be provided only as follows: **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(i) The lower beam shall be provided in one of the following ways:

(A) By the outboard light source (or the uppermost if arranged vertically) designed to conform to the lower beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the lower beam requirements of Figure 17.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) designed to conform to the upper beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the upper beam requirements of Figure 17.

(3) [The lower and upper beams of a headlamp system consisting of four lamps, using any combination of light sources except those specified in paragraph (d) of this section, each lamp containing only a single light source, shall be provided only as follows: **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "L."

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Figure 15. The lens of each such headlamp shall be marked with the letter "U."

(f) Each lens reflector unit manufactured as replacement equipment shall be designed to conform to the requirements of paragraphs (d) and (e) of this section when any standardized replaceable light source appropriate for such unit is inserted in it.

(g) [The lens of each replaceable bulb headlamp using any Type light source, except HB1 used singly or dually, within a headlamp system on a motor vehicle, shall permanently display the Type designation for that light source on the lens in front of each light source. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(h) The system shall be aimable in accordance with paragraph S7.7.

(i) Each headlamp shall meet the requirements of paragraphs S7.4(h) and (i), except that the sentence in (h) to verify sealing according to S8.9 *Sealing* does not apply.

S7.6 Standardized Replaceable Light Sources. Each standardized replaceable light source shall be designed to conform to the following requirements:

(a) A Type HB1 light source shall be designed to conform to the dimensions specified in Figure 3 and shall incorporate a silicone O-ring. Its maximum power on the lower beam shall be 50 watts, and on the upper beam, 70 watts. Its luminous flux in lumens shall be 700 +/− 15% on the lower beam and 1200 +/− 15% on the upper beam.

(b) A Type HB2 light source shall be designed to conform to the dimensions specified in Figure 23. Its maximum power on the lower beam shall be 65 watts, and on the upper beam, 72 watts. Its luminous flux in lumens shall be 910 plus or minus 10% on the lower beam, and 1500 plus or minus 10% on the upper beam.

(c) A Type HB3 light source shall be designed to conform to the dimensions specified in Figure 19. Its maximum power on the upper beam shall be 70 watts. Its luminous flux in lumens shall be 1700 +/− 12%.

(d) A Type HB4 light source shall be designed to conform to the dimensions specified in Figure 20. Its maximum power shall be 60 watts on the lower beam, and its luminous flux in lumens on the lower beam shall be 1000 +/− 15%.

(e) [A Type HB5 light source shall be designed to conform to the diemensions specified in Figure 24. Its maximum power shall be 60 watts on the lower beam, and 70 watts on the upper beam. Its luminous flux in lumens shall be 1000 +/− 15% on the lower beam, and 1350 +/− 15% on the upper beam. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

(f) [The filament of a light source shall be seasoned before measurement of maximum power and luminous flux. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

[(g)] Measurement of maximum power and luminous flux shall be made with the direct current test voltage regulated within one quarter of one percent. The test voltage shall be design voltage, 12.8v. The measurement of luminous flux shall be in accordance with the Illuminating Engineering Society of North America, LM–45; *IES Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps* (April 1980), shall be made with the black cap installed on [Types HB1, HB2, and HB4, and Type HB5, and shall be made with the electrical conductor and light source base shrouded with an opaque white colored cover, except for the portion normally located within the interior of the lamp housing. The measurement of luminous flux for the Types HB3 and HB4 shall be with the base covered with a white cover shown in Figures 19–1 and 20–1. The white covers are used to eliminate the likelihood of incorrect lumen measurement that will occur should the reflectance of the light source base and electrical connector be low.

[(h) The capsule, lead wires and/or terminals, and seal on each Type HB1, Type HB3, Type HB4, and Type HB5 light source shall be installed in the base as shown in Figure 25 so as to provide an air-tight seal. Such a seal exists when no air bubbles shall appear on the low pressure (connector) side after the light source has been immersed in water for one minute while inserted in a cylindrical aperture specified for the light source in Figure 25, and subjected to an air pressure of 70 kPa (10 P.S.I.G.) on the glass capsule side. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

[(i)] After the force deflection test conducted in accordance with S9, the permanent deflection of the glass envelope shall not exceed 0.005 in. (0.13mm) in the direction of the applied force.

[(j)] A general tolerance shall apply to Figure 3 as follows: +/− 0.004 in. (0.10 mm) to all linear dimensions and +/− 1 degree 00 minutes to all angular dimensions except for referenced dimensions and unless otherwise specified.

[(k) Each standardized light source manufactured on or after December 1, 1989, shall be marked with the symbol DOT and with a name or trademark in accordance with S7.2. In addition, the base of each such light source shall be marked with its HB Type designation. **(55 F.R. 13138—April 9, 1990. Effective: May 9, 1990)]**

S7.7 Aimability Performance Requirements.

S7.7.1 Each headlamp (other than a headlamp designed to conform to paragraph S7.3), or beam contributor, shall be equipped with fiducial marks, aiming pads or similar references of sufficient detail and accuracy for determination of an appropriate vehicle plane to be used with the photometric procedures of SAE J1383 APR 85 for correct alignment with the photometer axis when being tested for photometric compliance, and to serve for the aiming reference when the lamp is installed on a motor vehicle. The fiducial marks, aiming pads, or similar references are protrusions, bubble vials, holes, indentations, ridges, scribed lines, or other readily identifiable marks established and described by the vehicle or lamp manufacturer.

S7.7.2 Each headlamp shall be installed on a motor vehicle with a mounting and aiming mechanism that allows aim inspection and adjustment of both vertical and horizontal aim, and is accessible for those uses without removal of any vehicle parts, except for protective covers removable without the use of tools.

S7.7.2.1. (a) When installed on the vehicle, adjustment of one aim axis through its full on-vehicle range shall not cause the aim of the other axis to deviate more than +/− 0.76 degree.

(b) If the performance specified in paragraph (a) of this section is not achievable, the requirements of paragraph S7.7.5.2(b)(3) apply, except that if the aiming mechanism is not a VHAD, the requirements specific to VHADs are not applicable, and the instructions shall be specific to the aiming mechanism installed.

[**S7.7.2.2.** If a headlamp is aimed by moving the reflector relative to the lens and headlamp

housing, or vice versa, it shall conform with the photometrics applicable to it with the lens at any position relative to the reflector within the aim range limits of paragraphs S7.7.3 and S7.7.4, or any combination.

[S7.7.3. When a headlamp system is tested in a laboratory, the range of its vertical aim shall not be less than +/− 4 degrees from the nominal correct air position for the intended vehicle application. When installed on a motor vehicle, the range of vertical aim shall be not less than the full range of pitch of the vehicle on which the headlamp system is installed. The installed range of static pitch angle shall as a minimum be determined from unloaded vehicle weight to gross vehicle weight rating, and incorporate pitch angle effects from maximum trailer or truck loadings, the full range of tire intermix sizes and suspensions recommended and/or installed by the vehicle manufacturer, and the anticipated effects of variable passenger loading. The vertical aim adjustment mechanism shall be continuously adjustable over the full range.

[S7.7.4. When a headlamp system is tested in a laboratory, the range of its horizontal aim shall be not less than 2.5 degrees from the nominal correct aim position for the intended vehicle application.

[S7.7.5. When a headlamp system is installed on a motor vehicle, it shall be aimable with either an externally applied aiming device or on-vehicle headlamp aiming devices installed by the vehicle manufacturer. When activated in a steady-burning state, headlamps shall not have any styling ornament or other feature, such as a translucent cover or grill, in front of the lens. Headlamp wipers may be used in front of the lens provided that the headlamp system is designed to conform with all applicable photometric requirements with the wiper stopper in any position in front of the lens.

[S7.7.5.1. **External aiming.** (a) The aim of the headlamps in each headlamp system, other than a headlamp system designed to conform to section S7.3, that is designed to use such external aiming devices, shall not deviate more than 0.30 degree when a downward torque of 20 lb.-in. (2.25 N-m) is removed from the headlamp in its design operating position. The downward force used to create the torque shall be applied parallel to the aiming reference plane, through the aiming pads, and displaced forward using a lever arm such that the force is applied on an axis that is prependicular to the aiming reference plane and originates at the center of the aiming pad pattern (see Figures 4-1 and 4-3). For headlamps using the aiming pad locations of Group 1, the distance between the point of application of force and the aiming reference plane shall be not less than 6.625 in. (168.3 mm) plus the distance from the aiming reference plane to the secondary plane, if used (see section S7.7.5.1(d)(1)). For headlamps using the aiming pad locations of Group II, the distance between the point of application of force and the aiming reference plane shall be not less than 6.609 in. (167.9 mm) plus the distance from the aiming reference plane to the secondary plane, if used. For headlamps using the nonadjustable Headlamp Aiming Device Locating Plates for the 146 mm diameter, the 176 mm diameter, and the 92 × 150 mm sealed beam units, the distance between the point of application of force and the aiming plane shall, respectively, be not less than 6.984 in. (177.4 mm), 6.937 in. (176.2 mm), and 7.625 in. (193.7 mm). **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

Each headlamp system that is designed to conform to paragraph S7.5 and that is designed to use such external aiming devices, and which is manufactured on or after December 1, 1989, shall comply with this paragraph.

(b) When a headlamp is installed on a motor vehicle, its aim in any direction shall not change by more than 0.30 degree nor shall the lamp recede more than 0.1 in. (2.5 mm.) after being subjected to an inward force of 50 pounds (222 newtons) applied evenly to the lens parallel to the mechanical axis.

(c) Each headlamp system mounting and aiming mechanism shall be subjected to a salt spray (fog) test in accordance with ASTM B117–73 *Method of Salt Spray (Fog) Testing* for a period of 50 hours, consisting of two successive 25 hour periods of 24 hours exposure followed by 1 hour of drying. At the end of 50 hours, the headlamp system shall be capable of meeting any of the applicable requirements of paragraph S7.7.

(d) Each headlamp system which is designed to use the Headlamp Aiming Device Locating Plates with adjustable legs for the 100 × 165 mm unit and the 142 × 200 mm unit, and which has adjustable length legs, shall meet the requirements of subparagraphs (1) and (2) below.

Group	Test point, degrees	Total for group, candela (see note 1)
1[1]	45L–5U, 45L–H, 45L–5D, . . .	45
2[1]	30L–H, 30L–5D	50
3	10L–10U, 10L–5U, V–10U, V–5U, 10R–10U, 10R–5U . . .	100
4	10L–H, 10L–5D, V–H, V–5D, 10R–H, 10R–5D	360
5[1]	30R–H, 30R–5D	50
6[1]	45R–5U, 45R–H, 45R–5D . . .	45

FIGURE 2—Minimum Luminous Intensity Requirement for Backup Lamps

[1] When 2 lamps of the same or symmetrically opposite design are used, the reading along the vertical axis and the averages of the readings for the same angles left and right of vertical for 1 lamp shall be used to determine compliance with the requirements. If 2 lamps of differing designs are used, they shall be tested individually and the values added to determine that the combined units meet twice the candela requirements.

When only 1 backup lamp is used on the vehicle, it shall be tested to twice the candela requirements.

(1) The lens shall have three aiming pads which meet the requirements of Figure 4, *Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units.* The aiming pads need not be centered at the geometric center of the lens, or on the optical axis. Except as provided in subparagraph (2), a whole number, which represents the distance in tenths of an inch (i.e. 0.3 inch = 3) from the aiming reference plane to the respective aiming pads which are not in contact with that plane, shall be inscribed adjacent to each respective aiming pad on the lens. The height of these numbers shall be not less than .157 in (4 mm). If there is interference between the plane and the area of the lens between the aiming pads, the whole number represents the distance to a secondary plane. The secondary plane shall be located parallel to the aiming reference plane and as close to the lens as possible without causing interference.

(2) If the most forward aiming pad is the lower inboard aiming pad, then the dimensions may be placed anywhere on the lens. The dimension for the outboard aiming pad (Dimension F in Figure 4) shall be followed by the letter "H" and the dimension for the center aiming pad shall be followed by the letter "V." The dimensions shall be expressed in tenths of an inch.

(e) Each headlamp may be designed to use the nonadjustable Headlamp Aiming Device Locating Plate for the 100 × 165 mm unit, the 142 × 200mm unit, the 146 mm diameter unit, or the 178 mm diameter unit of SAE J602, or the 92 × 150 mm Type F unit, and incorporate lens mounted aiming pads as specified for those units in Figures 10, 13, 5, or 7 respectively in SAE J1383 APR 85, or Figure 11 of this standard for the Type F unit. If so designed, no additional lens marking is necessary to designate the type of plate or dimensions.

[S7.7.5.2 **On-vehicle aiming.** Each headlamp system that is capable of being aimed by equipment installed on the vehicle shall include a Vehicle Headlamp Aiming Device (VHAD) that conforms to the following requirements:

(a) *Aim.* The VHAD shall provide for headlamp air inspection and adjustment in both the vertical and horizontal axes.

(1) *Vertical aim*: The VHAD shall include the necessary references and scales relative to the horizontal plane to assure correct vertical aim for photometry and aiming purposes. An off-vehicle measurement of the angle of the plane of the ground is permitted. In addition, an equal number of graduations from the "O" position representing angular changes in the axis in the upward and downward directions shall be provided.

(i) Each graduation shall represent a change in the vertical position of the mechanical axis not larger then 0.19 degree (1 in. at 25 ft.) to provide for variations in aim at least 1.2 degrees above and below the horizontal, and have an accuracy relative to the zero mark of less than 0.1 degree.

(ii) The VHAD shall be marked to indicate headlamp aim movement in the upward and downward directions.

(iii) Each graduation shall indicate a linear movement of the scale indicator of not less than 0.05 in. (1.27 mm) if a direct reading analog indicator is used. If a remote reading indicator is provided, it shall represent the actual aim movement in a clear, understandable format.

(iv) The vertical indicator shall perform through a minimum range of +/− 1.2 degrees.

(v) Means shall be provided in the VHAD for compensation for deviations in floor slope not

less than 1.2 degrees from the horizontal that would affect the correct positioning of the headlamp for vertical aim.

(vi) The graduations shall be legible under an illumination level not greater than 30 foot candles, measured at the top of the graduation, by an observer having 20/20 vision (Snellen), and shall permit aim adjustment to within 0.19 degree (1 in. at 25 ft.).

(2) *Horizontal aim.* The VHAD shall include references and scales relative to the longitudinal axis of the vehicle necessary to assure correct horizontal aim for photometry and aiming purposes. An "O" mark shall be used to indicate alignment of the headlamps relative to the longitudinal axis of the vehicle. In addition, an equal number of graduations from the "O" position representing equal angular changes in the axis relative to the vehicle axis shall be provided.

(i) Each graduation shall represent a change in the horizontal position of the mechanical axis not greater than 0.38 degree (2 in. at 25 ft.) to provide for variations in aim at least 0.76 degree (4 in. at 25 ft.) to the left and right of the longitudinal axis of the vehicle, and shall have an accuracy relative to the zero mark of less than 0.1 degree.

(ii) The VHAD shall be marked to indicate headlamp aim movement in the left and right directions.

(iii) The graduations shall be legible under an illumination level not greater than 30 foot candles, measured at the top of the top of the radiator, by an observer having 20/20 vision (Snellen), and shall permit aim adjustment to within 0.38 degree (2 in. at 25 ft.).

(iv) The horizontal indicator shall perform through a minimum range of +/− 0.76 degree (4 in. at 25 ft.); however, the indicator itself shall be capable of recalibration over a movement of +/− 2.5 degrees relative to the longitudinal axis of the vehicle to accommodate any adjustment necessary for recalibrating the indicator after vehicle repair from accident damage.

(b) *Aiming instructions.* (1) The instructions for properly aiming the headlighting system using the VHAD shall be provided on a label permanently affixed to the vehicle adjacent to the VHAD, or in the vehicle operator's manual. The instructions shall advise that the headlighting system is properly aimed if the appropriate vertical plane (as defined by the vehicle manufacturer) is perpendicular to both the longitudinal axis of the vehicle, and a horizontal plane when the vehicle is on a horizontal surface, and the VHAD is set at "O" vertical and "O" horizontal.

(2) Should a remote indicator or a remote indicator and adjuster be provided, the instructions shall be placed in the operator's manual, and may also be placed on a label adjacent to the VHAD.

[(3) Should the mechanism not meet the requirements of S7.7.2.1, on each motor vehicle manufactured on or after September 1, 1990, a cautionary label shall be placed adjacent to the mechanism stating the caution and including either the reason for the caution or the corrective action necessary. Each such label shall also refer the reader to the vehicle operator's manual for complete instructions. Each such vehicle shall be equipped with an operator's manual containing the complete instructions appropriate for the mechanism installed. **(55 F.R. 4424—February 8, 1990. Effective: March 12, 1990)]**

(c) *Testing the VHAD.*

(1) The headlamp assembly (the headlamp(s) and the VHAD(s) mechanism) shall be mounted on a level goniometer, aligned to a photometer located not less than 60 ft. (18.3m) from the VHAD assembly. The assembly shall be mechanically aimed using the VHAD in accordance with the manufacturer's instructions as provided with the vehicle on which the VHAD is intended to be used. A ¼ degree reaim is permitted in any direction at any test point to allow for variations in readings between laboratories. The test shall be conducted in accordance with the procedures of paragraphs 4.1 and 4.1.4 of SAE J1383 APR 85. Under these conditions the mounted headlamp assembly shall be designed to conform to the photometric requirements appropriate for the headlamp system under test.

(2) When tested in accordance with subsection (1) of this section, with any replacement headlamp unit(s) or light sources intended for use in the system under test, the VHAD and headlamp system shall be designed to conform to the photometric performance requirements appropriate for the system under test.

(3) The same VHAD and associated headlamp(s) (or headlamp assembly) shall be rigidly mounted in a headlamp test fixture and comply with the following laboratory test procedures:

(i) Each graduation on the horizontal and vertical aim scales shall be checked and any variation from the correct aim shall not exceed +/- 0.2 degree, and +/- 0.1 degree, respectively.

(ii) With the aiming plane horizontal and vertical and with the scale on the device set at O, the aimer shall be adjusted before each of the following tests to assure that the indicators are centered at O.

(ii)(A) The VHAD and an unlighted headlamp assembly shall be stabilized at 20 +/- 5 degrees F (-7 +/- 3 degrees C) in a circulating air environmental test chamber. After a period of 30 minutes, when measured at that soak temperature, the variation from correct horizontal or vertical aim shall not exceed +/- 0.2 degree, and +/- 0.1 degree, respectively.

(ii)(B) The VHAD, and the headlamp assembly with its highest wattage filament (or combination of filaments intended to be used simultaneously) energized at its design voltage, shall than be stabilized at 100 +/- 5 degrees F (38 +/- 3 degrees C) in a circulating air environmental test chamber. After a period of 30 minutes, when measured at that soak temperature, the variation from correct horizontal and vertical aim shall not exceed +/- 0.2 degree, and +/- 0.1 degree, respectively.

(ii)(c) The VHAD and an unlighted headlamp assembly shall then be placed in a circulating air environmental test chamber and exposed to a temperature of 140 +/- 5 degrees F (60 +/- 3 degrees C) for 24 hours, followed by a temperature of -40 5 degrees F (-40 +/- 3 degrees C) for 24 hours and then permitted to return to room temperature, after which the VHAD and headlamp assembly shall show no damage which would impair its ability to perform as specified herein. The variation from correct horizontal or vertical aim shall not exceed +/- 0.2 degree, and +/- 0.1 degree, respectively.

(ii)(d) The VHAD and headlamp assembly shall then be tested according to the corrosion test procedure of paragraph S7.7.5.1(c).

(ii)(E) The VHAD and headlamp assembly shall then be tested for photometric compliance as specified in paragraphs S7.7.5.2(c)(1) and (2).

S8 Tests and Procedures for Integral Beam and Replaceable Bulb Headlighting Systems. When tested in accordance with the following procedures, each integral beam headlamp shall meet the requirements of paragraph S7.4, and each replaceable bulb headlamp shall meet the requirements of paragraph S7.5.

S8.1 Photometry. Each headlamp to which paragraph S8 applies shall be tested according to paragraphs 4.1 and 4.1.4 of SAE Standard J1383 APR 85 for meeting the applicable photometric requirements, after each test specified in paragraphs S8.2, S8.3, S8.5, S8.6.1, S8.6.2, and S8.7. A ¼ degree reaim is permitted in any direction at any testpoint.

S8.2. Abrasion. (a) A headlamp shall be mounted in the abrasion-test fixture in the manner indicated in Figure 5 with the lens facing upward.

(b) An abrading pad meeting the requirements in paragraphs (c) (1) through (c) (4) of this section shall be cycled back and forth (1 cycle) for 11 cycles at 4 ± 0.8 in. (10 cm ± 2 cm) per second over at least 80 percent of the lens surface, including all the area between the upper and lower aiming pads, but not including lens covers and edges.

(c) (1) The abrading pad shall be not less than 1.0 ± .04 in. (2.5 cm ± .1 cm) wide, constructed of 0000 steel wool, and rubber cemented to a rigid base shaped to the same vertical contour of the lens. The "grain" of the pad shall be perpendicular to the direction of motion.

(2) The abrading pad support shall be equal in size to the pad and the center of the support surface shall be within ± .08 in. (± 2 mm) of parallel to the lens surface.

(3) The density of the abrading pad shall be such that when the pad is mounted to its support and is resting unweighted on the lens, the base of the pad shall be no closer than .125 in. (3.2 mm) to the lens at its closest point.

(4) When mounted on its support and resting on the lens of the test headlamp, the abrading pad shall then be weighted such that a pad pressure of 2.0 ± .15 psi (14 ± 1 kPa) exists at the center and perpendicular to the face of the lens.

(d) A pivot shall be used if it is required to follow the contour of the lens.

(e) Unused steel wool shall be used for each test.

[S8.3.] Chemical resistance. (a) The entire exterior lens surface of the fixtured headlamp and top surface of the lens-reflector joint shall be wiped once to the left and once to the right with a 6-inch-square soft cotton cloth (with pressure equally applied) which has been saturated once in a container with 2 ounces of one of the test fluids listed in paragraph (b) of this section. The lamp shall be wiped within 5 seconds after removal of the cloth from the test fluid.

(b) The test fluids are:

(1) ASTM Reference Fuel C, which is composed of Isooctane 50 volume % and Toluene 50 volume %. Isooctane must conform to A2.7 in Annex 2 of the Motor Fuels Section of the 1985 *Annual Book of ASTM Standards* Vol. 05.04, and Toluene must conform to ASTM specification D362-84, *Standard Specification for Industrial Grade Toluene.* ASTM Reference Fuel C must be used as specified in:

(i) Paragraph A2.3.2 and A2.3.3 of Annex 2 to *Motor Fuels, Section 1* in the *1985 Annual Book of ASTM Standards*; and

(ii) OSHA Standard 29 CFR 1910.106–*Handling Storage and Use of Flammable Combustible Liquids.*

(2) Tar remover (consisting by volume of 45% xylene and 55% petroleum base mineral spirits).

(3) Power steering fluid (as specified by the vehicle manufacturer for use in the motor vehicle on which the headlamp is intended to be installed).

(4) Windshield washer fluid consisting of 0.5% monoethanolamine with the remainder 50% concentrations of methanol/distilled water by volume.

(5) Antifreeze (50% concentration of ethylene glycol/distilled water by volume).

(c) After the headlamp has been wiped with the test fluid, it shall be stored in designed operating attitude for 48 hours at a temperature of 73°F ± 7° (23°C ± 4°) and a relative humidity of 30 ± 10 percent. At the end of the 48-hour period, the headlamp shall be wiped clean with a soft dry cotton cloth and visually inspected.

[S8.4.] Corrosion. (a) A connector test shall be performed on each filament circuit prior to the test in subparagraph (b) according to Figure 1 of SAE Standard J580, [DEC 86]. The power source shall be set to provide 12.8 volts and the resistance shall be set to produce 10 amperes.

(b) The headlamp with connector attached to the terminals, unfixtured and in its designed operating attitude with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be subjected to a salt spray (fog) test in accordance with ASTM B117-73, *Method of Salt Spray (FOG) Testing,* for a period of 240 hours, consisting of 10 successive 24-hour periods. During each interval, the headlamp shall be mounted in the middle of the chamber and exposed for 23 hours to the salt spray. The spray shall not be activated for the 24th hour. The bulb shall be removed from the headlamp and from the test chamber during the one hour of salt spray deactivation and reinserted for the start of the next test cycle, at the end of the first and last three 23-hour periods of salt spray exposure, and at the end of any two of the fourth through seventh 23-hour periods of salt-spray exposure. The test chamber shall be closed at all times except for a maximum of 2 minutes which is allowed for removal or replacement of a bulb during each period. After the ten cycles, the lens reflector unit without the bulb shall be immersed in deionized water for five minutes, then secured and allowed to dry by natural convection only.

(c) Using the voltage, resistance and pretest setup of subparagraph (a), the current in each filament circuit shall be measured after the test conducted in subparagraph (b).

[S8.5.] Dust. The headlamp, mounted on a headlamp test fixture, with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be positioned within a cubical box, with inside measurements of 35.4 in. (900 mm) on each side, or larger if required for adequate wall clearance, i.e., a distance of at least 5.9 in. (150 mm) between the headlamp and any wall of the box. The box shall contain 9.9 lb. (4.5 kg) of fine powdered cement which conforms to the ASTM C150–77 *Specification for Portland Cement.* Every 15 minutes, the cement shall be agitated by compressed air or fan blower(s) by projecting blasts of air for a 2-second period in a downward direction so that the cement is diffused as uniformly as possible throughout the entire box. This test shall be continued for five hours, after which the exterior surfaces of the headlamp shall be wiped clean.

S8.6. Temperature and internal heat test. A headlamp with one or more standardized replaceable light sources shall be tested according to S8.6.1 and S8.6.2. Tests shall be made with all filaments lighted at design voltage that are intended to be used simultaneously in the headlamp and which in combination draw the highest total wattage. These include but are not limited to filaments used for turn signal lamps, fog lamps, parking lamps, and headlamp lower beams lighted with upper beams when the wiring harness is so connected on the vehicle. If a turn signal is included in the headlamp assembly, it shall be operated at 90 flashes a minute with a 75±2% current "on time". If the lamp produces both the upper and lower beam, it shall be tested in both the upper beam mode and the lower beam mode under the conditions above described, except for a headlamp with a single Type HB1 or HB2 light source.

S8.6.1. Temperature cycle. A headlamp, mounted on a headlamp test fixture, shall be subjected to 10 complete consecutive cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the lamp shall be energized commencing at point "A" of Figure 6 and de-energized at point "B." Separate or single test chambers may be used to generate the environment of Figure 6. All drain holes, breathing devices or other openings or vents of the headlamp shall be in their normal operating positions.

S8.6.2. Internal Heat Test. (a) The headlamp lens surface that would normally be exposed to road dirt shall be uniformly sprayed with any appropriate mixture of dust and water or other appropriate materials to reduce the photometric output at the H-V test point of the upper beam (or the ½D–1 ½R test point of the lower beam as appropriate) to 25±2% of the output originally measured in the photometric test conducted pursuant to paragraphs S7.4(i), or S7.5(a) through (e), as applicable. A headlamp with a single Type HB1 or HB2 light source shall be tested on the upper beam only.

Such reduction shall be determined under the same conditions as that of the original photometric measurement.

(b) After the photometric output of the lamp has been reduced as specified in paragraph (a), the lamp and its mounting hardware shall be mounted in an environmental chamber in a manner similar to that indicated in Figure 7, *Dirt/Ambient Test Setup.* The headlamp shall be soaked for one hour at a temperature of 95+7−0 degrees F (35+4−0 degrees C) and then the lamp shall be energized according to S8.6 for one hour in a still air condition, allowing the temperature to rise from the soak temperature.

(c) The lamp shall be returned to a room ambient temperature of 73+7−0 degrees F (23+4−0 degrees C) and a relative humidity of 30±10% and allowed to stabilize to the room ambient temperature. The lens shall then be cleaned.

S8.7. Humidity. [(a) The test fixture consists of a horizontal steel plate to which three threaded steel or aluminum rods of ½ inch diameter are screwed vertically behind the headlamp. The headlamp assembly is clamped to the vertical rods, which are behind the headlamp. All attachments to the headlamp assembly are made behind the lens and vents or openings, are not within 2 inches laterally of a vent inlet or outlet.

(b) The mounted headlamp assembly is oriented in its design operating position, and is placed in a controlled environment at a temperature of 100+7−0 degrees F (38+4−0 degrees C) with a relative humidity of not less than 90 percent. All drain holes, breathing devices, and other openings are in their normal operation positions for all phases of the humidity test. The headlamp shall be subjected to 24 consecutive 3-hour test cycles. In each cycle, it shall be energized for 1 hour at design voltage with the highest combination of filament wattages that are intended to be used, and then deenergized for 2 hours. If the headlamp incorporates a turn signal, it shall flash at 90 flashes per minute with a 75+/−2 percent current "on-time."

(c) Within 3 minutes after the completion of the 24th cycle, the air flow test will begin. The following shall occur: the mounted assembly shall be removed, placed in an insulating box and covered with foam material so that there is no visible air space around the assembly; the box shall be closed, taken to the air flow test chamber, and placed within it. Inside the chamber, the assembly with respect to the airflow, shall be oriented in its design operating position. The assembly is positioned in the chamber so that the center of the lens is in the center of the opening of the air flow entry during the test. The headlamp has at least 3 inches clearance on all sides, and at least 4 inches to the entry and exit ducts at the closest points. If vent

tubes are used which extend below the lamp body, the 3 inches are measured from the bottom of the vent tube or its protection. The temperature of the chamber is 73+4−0 degrees F (23+4−0 degrees C) with a relative humidity of 30+10−0 percent. The headlamp is not energized.

(d) Before the test specified in paragraph (e) of this section, the uniformity of the air flow in the empty test chamber at a plane 4 inches downstream of the air entry duct shall have been measured over a 4-inch square grid. The uniformity of air flow at each grid point is +/− 10 percent of the avehage air flow specified in paragraph (e) of this section.

(e) The mounted assembly in the chamber shall be exposed, for one hour, to an average flow of 330+0−30 ft/min. as measured with an air velocity measuring probe having an accuracy of +/−3 percent in the 330 ft/min. range. The average air flow is the average of the velocity recorded at six points around the perimeter of the lens. The six points are determined as follows: at the center of the lens, construct a horizontal plane. The first two points are located in the plane, 1 inch outward from the intersection of the plane and each edge of the lens. Then, trisect the distance between these two points and construct longitudinal vertical planes at the two intermediate locations formed by the trisection. The four remaining points are located in the vertical planes, one inch above the top edge of the lens, and one inch below the bottom edge of the lens.

(f) After one hour, the headlamp is removed and inspected for moisture. **(56 F.R. 10185—March 11, 1991. Effective: September 9, 1991)]**

S8.8 Vibration. A vibration test shall be conducted in accordance with the procedures of SAE Standard J575e *Tests for Motor Vehicle Lighting Devices and Components* August 1970, and the following: The table on the adapter plate shall be of sufficient size to completely contain the test fixture base with no overhang. The vibration shall be applied in the vertical axis of the headlamp system as mounted on the vehicle. The filament shall not be energized.

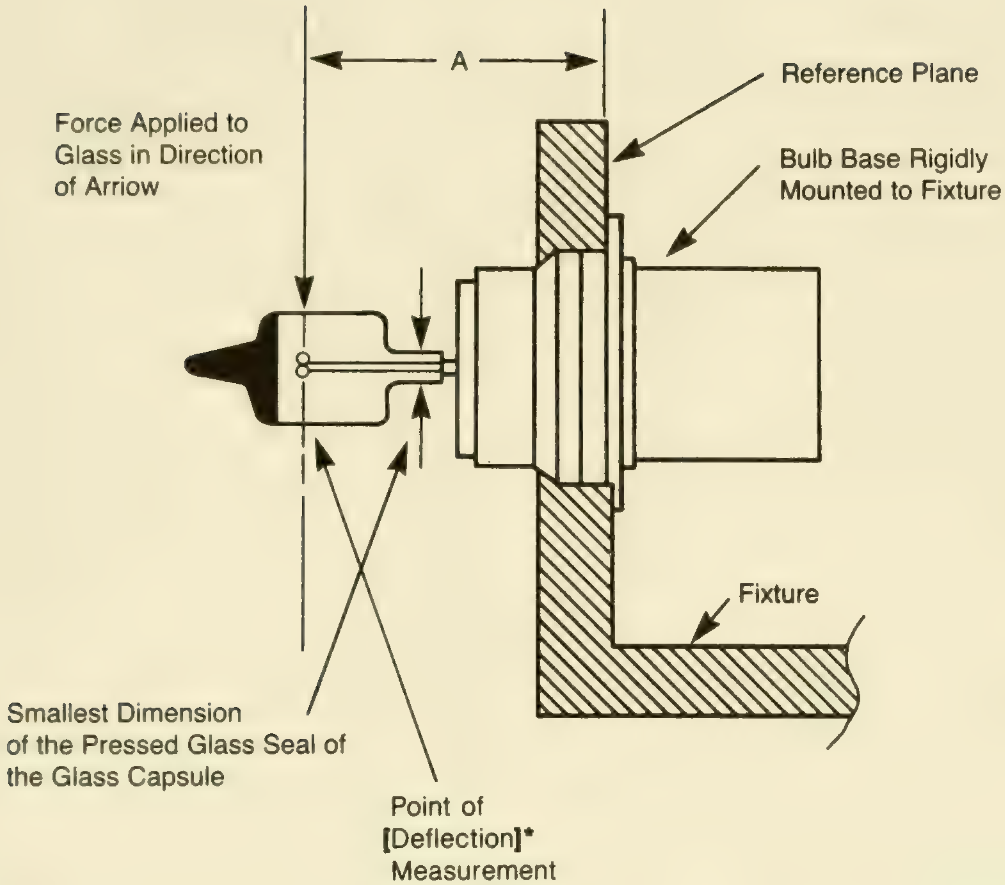
[S8.9 Sealing. An unfixtured headlamp in its design mounting position shall be placed in water at a temperature of 176 +/− 5 degrees F (60 +/− 3 degrees C) for one hour. The headlamp shall be energized in its highest wattage mode, with the test voltage at 12.8 +/− 0.1 V. during immersion. The lamp shall then be de-energized and immediately submerged in its design mounting position into water at 32 +5−0 degrees F (0 +3−0 degrees C). The water shall be in a pressurized vessel, and the pressure shall be increased to psi (70 kPa), upon placing the lamp in the water. The lamp shall remain in the pressurized vessel for a period of thirty minutes. This entire procedure shall be repeated for four cycles. Then the lamp shall be inspected for any signs of water on its interior. During the high temperature portion of the cycles, the lamp shall be observed for signs of air escaping from its interior. If any water occurs on the interior or air escapes, the lamp is not a sealed lamp.

S9. Deflection test for standardized replaceable light sources. With the light source rigidly mounted in a fixture in a manner indicated in Figure 8, a force of 4.0 ± 0.1 pounds (17.8 ± 0.4N) is applied at a distance "A" from the reference plane perpendicular to the longitudinal axis of the glass capsule and parallel to the smallest dimension of the pressed glass capsule seal. The force shall be applied (using a rod with a hard rubber tip with a minimum spherical radius of .039 in (1 mm) radially to the surface of the glass capsule in four locations in a plane parallel to the reference plane and spaced at a distance "A" from that plane. These force applications shall be spaced 90 degrees apart starting at the point perpendicular to the smallest dimension of the pressed seal of the glass capsule. The bulb deflection shall be measured at the glass capsule surface at 180 degrees opposite to the force application.

S10. Simultaneous Aim Photometry Tests. (a) *Type F Headlamp Systems.* The assembly shall be located on a goniometer placed not less than 60 feet (18.3m) from the photometer. The LF unit shall be aimed mechanically by centering the unit on the photometer axis and by alingning the aiming plane of the lens perpendicular to the photometer axis. Then the assembly shall be moved in a plane parallel to the established aiming plane of the LF headlamp until the UF headlamp is centered on the photometer axis. Photometry measurements of the UF photometry unit shall be completed using the aiming plane so established, and the procedures of section S4.1 and 4.1.4 Standard J1383 APR 85, and Figure 15. A reaim tolerance of ± ¼ degree is permitted in any direction at any test point.

(b) *Integral Beam Headlamp Systems.* The assembly used for simultaneously aiming more than one integral beam headlamp shall be placed on a test fixture on a goniometer located not less than 60 feet (18.3m.) from the photometer. The assembly shall be aimed by centering the geometric center of the lower beam lens(es) on the photometer axis and by aligning the photometer axis to be perpendicular to the aiming reference plane or appropriate vertical plane defined by the manufacturer of any lower beam contributor. Photometric compliance of the lower beam shall be determined with all lower beam contributors illuminated and in accordance with sections 4.1 and 4.1.6 of SAE Standard J1383 APR 85, and Figure 15. The assembly shall then be moved in a plane parallel to the established aiming plane of the lower beam until the assembly is located with the geometric center of the upper lens(es) on the photometer axis. Photometric compliance for upper beam shall now be determined using the figure and procedure specified for the lower beam. During photometric testing, a ¼ degree reaim is permitted in any direction at any test point.

35 F.R. 16842
October 31, 1970



Standardized Replaceable Light Source Type	Dimension "A"
HB1	44.50 ± 0.38mm (1.75 ± 0.015 in)
HB2	31.25 ± 0.40mm (1.23 ± 0.012 in)
HB3	31.50 ± 0.20mm (1.24 ± 0.008 in)
HB4	31.50 ± 0.20mm (1.24 ± 0.008 in)
HB5	44.50 ± 0.25mm (1.75 ± 0.010 in)

*(56 F.R. 12125—March 22, 1991. Effective: March 22, 1991)

Figure 8. Bulb Deflection Test

(See reverse page for dimensional specifications)

TABLE III.—Required Motor Vehicle Lighting Equipment
All Passenger Cars and Motorcycles, and Multipurpose Passenger Vehicles, Trucks, Trailers, and Buses, of Less Than 80 Inches Overall Width

Item Column 1	Passenger cars, multipurpose passenger vehicles, trucks, and buses Column 2	Trailers Column 3	Motorcycles Column 4	Applicable SAE standards or recommended practices Column 5
Headlamps	See S7			[For motorcycles only, J584, April 1964, J566, January 1960.]
Taillamps [3]	2 red	2 red	1 red	J585e, September 1977.
Stoplamps	2 red	2 red	1 red	SAE J586, February 1984.
High mounted stoplamp	1 red, for passenger cars only	Not required	Not required	J186a, September 1977.
License plate lamp [1]	1 white	1 white	1 white	J587, October 1981.
Parking lamps [2]	2 amber or white	None	None	J222, December 1970.
Reflex reflectors	4 red, 2 amber	4 red; 2 amber	3 red; 2 amber	J594f, January 1977.
Intermediate side reflex reflectors [5]	2 amber	2 amber	None	J594f, January 1977.
Intermediate side marker lamps [5]	2 amber	2 amber	None	J592e, July 1972.
Side marker lamps	2 red, 2 amber	2 red; 2 amber	None	J592e, July 1972.
Backup lamp	1 white	None	None	J593c, February 1968.
Turn signal lamps [3]	2 red or amber; 2 amber.	2 red or amber.	2 amber; 2 red or amber.	SAE J588, November 1984.
Turn signal operating unit [3] [4]	1	None	1	J589, April 1964.
Turn signal flasher	1	None	1	J590b, October 1965.
Vehicular hazard warning signal operating unit	1	None	None	J910, January 1966.
Vehicular hazard warning signal flasher	1	None	None	J945, February 1966.

[(56 F.R. 12123—March 22, 1991. Effective: March 22, 1991)]

[1] See S5.1.1.10. [2] See S5.1.1.11–12. [3] See S5.5.6. [4] See S5.1.1.5. [5] See S5.1.1.3.

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection
(Docket No. 1-21; Notice 10)

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: In mid-1990, this agency published a final rule amending certain provisions in Standard No. 114, *Theft Protection*, to protect against injuries caused by vehicle rollaway in vehicles with automatic transmissions. In response to petitions for reconsideration, this notice amends these requirements to provide manufacturers with greater flexibility in designing key-locking and transmission shift locking systems while ensuring that theft protection is provided and vehicle rollaway is prevented.

EFFECTIVE DATE: The changes made by this rule become effective for vehicles manufactured on or after September 1, 1992.

SUPPLEMENTARY INFORMATION:

On April 5, 1988, NHTSA published a notice of proposed rulemaking (NPRM) intended to address the problems of steering lock-up and transmission lever shifting. (53 FR 11105) For automatic transmission vehicles, the notice proposed to require an ignition-key locking system that would prevent the shifting of the transmission whenever the key was removed and prevent the removal of the key except when the transmission was locked in "park." It also proposed to require that automatic transmission vehicles with a steering column lock have a system that would permit engagement of that lock only when the transmission was in "park" and the ignition key had deactivated the vehicle's engine. For manual transmission vehicles with a steering column lock, the notice proposed to require that that lock would be engageable only when the ignition key had deactivated the vehicle's engine and the operator had performed an additional manual action involving a device other than the ignition key.

Forty comments were submitted to Docket 01-21-Notice 7 by motor vehicle manufacturers, insurance companies, police organizations, trade associations, and the public. In response to requests, the agency also met with several manufacturers which demonstrated potential system designs.

On May 30, 1990, NHTSA published a final rule addressing the issues raised in the NPRM (55 F.R. 21868). The agency decided to amend section S4.2(b) to prevent vehicle rollaway caused by shifting the transmission lever in automatic transmission vehicles. As amended, section S4.2(b) requires automatic transmission vehicles with a "park" position to have a key-locking system that prevents the removal of the key unless the transmission is locked in "park" or becomes locked in "park" as the direct result of removing the key. The agency did not adopt its proposal regarding steering lockup on automatic transmission vehicles, explaining that the purpose of that proposal would be essentially met as a result of the amendment it adopted regarding the removal of the key. Further, the agency decided not to adopt additional requirements in relation to steering lock-up on manual transmission vehicles.

NHTSA received petitions for reconsideration of this rule from Nissan, Rover Group, and Mr. Wilson Sherman of the Automobile Safety Foundation (ASF). In addition, several manufacturers including Mazda, Toyota, Subaru, Jaguar, and Honda expressed interest in the final rule but either did not request reconsideration or did not do so in a timely fashion in accordance with 49 CFR 553.35. Jaguar and Toyota submitted documents which they apparently viewed as petitions for reconsideration However, because they were submitted after section 553.35's filing deadline, they cannot be treated as petitions for reconsideration. Instead, the agency has treated these submissions as petitions for rulemaking. This notice responds to the petitions for reconsideration.

In responding to the petitions for reconsideration, the agency has been able to respond to the significant issues raised in the rulemaking petitions submitted by

the other manufacturers because the late petitions addressed identical concerns about transmission shift lock overrides, emergency key release systems, and the application of S4.3 to park lock systems.

For the convenience of the reader, this notice follows the May 30 final rule's organization and format. When a section heading used in the final rule does not appear in this preamble, it means that no petitions for reconsideration requested changes to the rule's provisions discussed in that section.

Safety Need About Steering Lock-up

In its petition for reconsideration, the ASF stated that "inadvertent lock-up poses a *nationwide emergency*, and therefore a comprehensive warning must be issued." (emphasis in original). The agency notes that Mr. Sherman and the ASF submitted numerous comments to Docket 1-21-No. 7, which the agency considered in developing the final rule. In its petition for reconsideration, the ASF similarly states that steering lock-up is a widespread safety problem, but presents no supporting data.

The agency concluded in its final rule that there is no safety need to justify adopting additional requirements to protect against steering lock-up on moving vehicles after removal of the ignition key. The agency's Final Regulatory Evaluation (FRE) identified only three crashes with three injuries and two fatalities that apparently resulted from steering lock-up over the course of approximately ten years. Based on the extremely low number of injuries and fatalities, NHTSA decided not to require additional measures designed to prevent the possibility of steering lock-up for moving vehicles. Even though the agency decided not to adopt new requirements expressly designed to prevent steering lock-up on moving vehicles, the final rule explained that the amendment to prevent transmission lever shifting accidents in automatic transmission vehicles will also prevent key removal while that type of vehicle is in motion. The amendment permits key removal only when the transmission is in "park."

Based on its analysis in developing the final rule, the agency concludes that there are insufficient documented instances of steering lock-up to warrant adopting additional requirements. As explained above, this decision is further supported by the fact that the final rule's amendments to prevent rollaway of automatic transmission vehicles also serve to prevent key-removal in those vehicles while they are moving.

As for ASF's request that the agency warn motor vehicle owners about steering lock-up, the agency has requested that the American Association of Motor Vehicle Administrators (AAMVA) distribute the final rule and a warning from the California driver's handbook about steering lock-up to the appropriate State officials to assist them in deciding if such a warning is necessary in their State. NHTSA has determined that for vehicles in use, it is more appropriate for the States to address this matter than NHTSA, which is authorized to issue Safety standards for new vehicles. In a letter to NHTSA dated June 22, 1990, AAMVA indicated that it had complied with the agency's request.

Purpose of the Amendment

The NPRM proposed modifying Standard No. 114's purpose and scope section (S1) to reflect the purpose of the amendments in the proposal. Thus, that section would have indicated that along with theft protection, the standard address vehicle rollaway. In response to comments critical of this proposal, the agency decided in the May 30 final rule not to add reference to the rulemaking's rollaway prevention aspects in the regulatory text. The preamble explained that the agency wanted to avoid creating the impression that the standard's focus was shifting away from theft protection. The preamble further noted that even though "NHTSA's goal in amending the standard is to provide adequate protection against injuries caused by shifting the automatic transmission lever, Standard 114 remains primarily a theft protection standard."

In its petition for reconsideration, Rover Group stated that the amendment in S4.2(b) to prevent vehicle rollaway did not contribute to meeting the safety needs and theft protection purpose of Standard No. 114, as explained in S1, and was, therefore, "unnecessary."

Instead of rescinding the amendment to S4.2(b) concerning rollaway, the agency has decided to increase manufacturer flexibility in complying with the rollaway provisions, as discussed later in this notice, and to make a conforming amendment to S1 so that it reflects the rollaway prevention aspects of the standard. Accordingly, section S1 is amended to indicate that while the primary purpose of the standard is to protect against theft, the standard also seeks to reduce the incidence of crashes resulting from rollaway of parked vehicles.

Emergency Overrides and Key Release Systems

In the NPRM, the agency proposed to require that automatic transmission vehicles have an ignition-key locking system that would prevent the shifting of the transmission whenever the key was removed and would prevent the removal of the key except when the trans-

mission was locked in "park." In addition, the notice proposed to require that if an automatic transmission vehicle had a steering column lock, that lock would be engageable only when the transmission was in "park" and the ignition key had deactivated the vehicle's engine. The NPRM also posed questions about alternative approaches and devices that might be able to reduce the problems of steering lock-up and gear shifting.

Several manufacturers, including Honda, Nissan, Subaru, Mazda, and Toyota, commented that their electrical transmission shift lock systems might have problems complying with the proposal to require a transmission shift lock on vehicles with automatic transmissions. These systems appeared to comply with the proposal during normal operation. However, certain systems might not comply if the battery or electrical system failed and the vehicle was equipped with an override device to allow it to be moved by shifting the lever out of "park." Honda, Nissan, and Toyota requested that the proposal be modified to allow for an emergency device to override the transmission lock so that a disabled vehicle could be moved. In addition, Nissan, Toyota, and Subaru requested that the proposal be further modified to permit key removal, even if the transmission was not in "park."

After analyzing its proposal in response to these comments, the agency adopted a requirement in S4.2(b) which did not include exceptions for emergency overrides. That amendment specifies that each automatic transmission vehicle with a "park" position must have a key-locking system that prevents removal of the key unless the transmission or transmission shift lever is locked in "park" or becomes locked in "park" as the direct result of removing the key.

Transmission Shift Override

In the final rule, NHTSA concluded that to enable a vehicle to be moved in case of electrical failure, an override to the transmission shift lock could be installed consistent with the NPRM and the final rule, provided the override could only be activated by the key used to control the vehicle. The preamble to the final rule explained that a manufacturer could install a manual override system that is tied to either the ignition part of the key-locking system or an auxiliary part of the key-locking system located near or as part of the manual override device. The agency explained that an override that could be operated without requiring a key might be detrimental to theft protection since an unauthorized person could operate that type of manual override. While the final rule acknowledged that this requirement would result in overrides differing from those initially anticipated by some manufacturers, the agency did not anticipate that compliance would be overly burdensome for the manufacturers.

In its petition, Rover Group asserted that the NPRM did not give the public adequate notice or opportunity to comment about permitting key-based overrides. After reviewing the NPRM and comments to it, the agency has concluded that permitting a key-based override was a logical outgrowth of its proposal and the public comments. Therefore, the agency believes that adequate notice was provided for the amendments to the final rule. In the NPRM, the agency asked a series of questions about types of key-locking and transmission shift locking systems currently in use and whether these systems would comply with the proposal. Although the proposal did not explicitly mention override devices, it put them at issue since it would have had the effect of prohibiting them. In response, several manufacturers, including Rover Group, commented about their systems. Several manufacturers noted that their systems had override devices and requested that the agency permit those devices Accordingly, the agency believes that adequate notice was provided.

In their petitions for reconsideration, Nissan and Rover Group requested that Standard No. 114 be amended to permit overrides to the transmission shift lock other than ones tied to the vehicle's key. Nissan explained that it has designed a shift lock emergency override system that is operable by depressing an exposed button on the shift lever console, independent of the key. In other contacts with the agency, Toyota, Mazda, Subaru, Honda, and Jaguar explained the workings of their key-less transmission lock overrides. These overrides typically are activated by pushing an exposed device located on the transmission shift console. As an alternative, Nissan and Honda suggested that the agency permit unexposed overrides that are operable only after using a tool to remove a surface covering the device.

In their petitions, Nissan and Rover Group stated that they did not believe that permitting a key-less override would be detrimental to theft protection if a vehicle were equipped with a steering lock. Other manufacturers, including Toyota and Jaguar voiced similar views. This situation led Nissan and Jaguar to suggest the standard's theft protection aspects could be ensured by permitting vehicles to have non-key override systems if they also have a steering column lock.

Upon reconsideration, NHTSA first wishes to clarify its rationale for not permitting exposed override devices, as described in the docket comments. As explained in the final rule, the principal purpose for the requirements in Standard No. 114 is to protect against theft and thereby reduce the incidence of injuries resulting from unauthorized use by, among other things, having the key-locking system prevent steering or forward self-mobility, or both. Thus, any vehicle design must prohibit the vehicle's operation by an

unauthorized user, i.e., anyone who does not have the vehicle's key. In describing vehicles that are equipped with steering locks, several manufacturers have correctly pointed out that, by preventing steering, such designs comply with the theft protection aspects of S4.2(b). Nevertheless, the agency notes that even though vehicles with steering locks protect against theft, they do not protect against the safety risk posed by vehicle rollaway, which was discussed at length in the NPRM and the final rule. These notices indicated that children playing in unattended vehicles have been injured when the vehicle rolls down an incline after they shift the transmission lever out of "park."

After reviewing various designs, the agency continues to believe that to prevent vehicle rollaway, young children should not be able to move the transmission shift lever. If a vehicle is equipped with a transmission shift override, it should be designed to ensure that young children cannot see or easily gain access to the override.

One way to prevent access by children and thus vehicle rollaway is to permit an override that is operable only by the vehicle's key because this typically ensures that the override is being activated by an authorized user. The preamble to the final rule explained that such a key-activated override was permissible. Based on the apparent confusion caused by not expressly stating this in the regulatory text, upon reconsideration, the agency has modified Standard No. 114 so that section S4.2.2(b) now states that the means for activating the override device may be operable by the key, as defined in S3 of the standard.

A second way to prevent access by children and thus vehicle rollaway is to permit key-less overrides that are not visible and are "child-proof." After reviewing suggested designs, the agency has determined that a key-less override could prevent activation by a child if it is covered by a surface that, when installed, prevents activation of the device and which is removable only by use of a tool such as a screwdriver. An emergency override that is visible and accessible to children such as an uncovered one located on the transmission console would not be child-proof and thus would not comply with section S4.2.2(b). To ensure further that young children cannot easily gain access to the override, a surface that could be removed with a person's hands alone would not be permissible. While the agency understands that prohibiting certain override designs such as exposed ones may require some manufacturers to modify their override designs, the agency has determined that such requirements are necessary to ensure that children cannot easily override the transmission shift lock and thus shift the transmission lever. The agency has determined that these amendments to the final rule will protect against theft and vehicle rollaway while providing manufacturers with greater design flexibility. The agency emphasizes that the amendment permits a key-less emergency override only if theft protection is ensured by a steering lock.

Emergency Key Release

As for the second type of exception to the requirements, Toyota, Nissan, and Subaru requested in their comments on the proposal that the proposed requirements be amended to permit key removal in any transmission position because their systems permit key removal in case of battery or electrical system failure. In the final rule, NHTSA decided not to adopt this approach, explaining that such emergency situations typically occur when the vehicle is in "park" and the lights are left on for long periods of time. The final rule further explained that even in the unusual situation of electrical failure when the vehicle's transmission is not in "park," a transmission with an electrical shift lock system could be mechanically shifted to "park" so that the key could be removed. Therefore, the agency did not anticipate a need to remove a key while the transmission is in a position other than "park."

In their petitions for reconsideration, Nissan and Rover Group asked that Standard No. 114 be amended to permit the operator to remove the key if the transmission is in a position other than "park." While Nissan conceded that electrical failure in this situation rarely occurs, it still believed that it happens often enough to necessitate permitting an emergency key release so that the key is not left in an unattended vehicle while the driver seeks help. Nissan explained that its key-locking system includes a mechanical emergency key release to permit key removal because its electrical key-locking system includes a solenoid that prevents key removal upon electrical failure. Nissan demonstrated that to gain access to the emergency key release, the driver must use a screwdriver to remove a surface covering the release. This led Nissan to state that the key release could not be activated unintentionally or be inadvertently removed while the vehicle was in motion. Range Rover believed that an expensive mechanical link between the transmission lever and the key-locking system would be necessary to comply with the final rule. Toyota demonstrated a key-locking system similar to Nissan's except that when electrical power fails, Toyota's solenoid acts differently than Nissan's, i.e., Toyota's solenoid releases the key instead of holding it in the key cylinder. Thus, with Toyota's key-locking system, upon electrical failure, the key could be removed in any transmission lever position.

Upon reconsideration, NHTSA has decided to permit a device which permits key removal while the transmission is in any position, provided that the following conditions are met. First, steering must be prevented upon key removal to ensure that Standard No. 114's theft protection aspects are not jeopardized. Second, the emergency device permitting key removal while the

transmission is in a position other than "park" should not be accessible during normal operation or else rollaway might occur. Third, to limit access to the emergency key release, it must be covered by a surface that prevents access to it except by use of a tool, such as a screwdriver. The agency has determined that limiting the access to the emergency key release is necessary to make it likely that key removal occurs only during unusual situations such as electrical failure. In addition, while NHTSA still believes that it is rare to have power failure when the transmission is in a position other than "park," it will still be beneficial for the owner of a disabled vehicle to be able to remove the key and lock the vehicle if he or she must leave the vehicle to seek help. The agency therefore has determined that providing manufacturers this additional design flexibility for their newly developed electrical transmission systems is warranted and will not harm Standard No. 114's safety or theft protection concerns.

As for Rover Group's concern that the final rule was a design-based requirement that would require use of an expensive and impracticable mechanical linkage, the agency disagrees. The variety of existing systems and prototypes demonstrated by several other manufacturers provide a measure of the performance-orientedness of the requirement. Further, while some manufacturers may have to modify their system designs, the agency believes that compliance with Standard No.114, as amended, will not be overly burdensome.

Application of S4.3 to Park Lock Systems

In the final rule, the agency modified the provision in S4.3 to state that "The prime means for deactivating the vehicle's engine or motor shall not activate the key-locking system described in S4.2(b)." The principal purpose of this provision has been to prohibit locking the steering column while the vehicle is in motion. In its comments to the proposal, Nissan requested that for automatic transmission vehicles, a gear shift lock activated while the transmission is already in "park" should be exempted. The final rule inadvertently did not address this comment.

In its petition for reconsideration, Nissan explained that its park lock system did not appear to comply with S4.3, as adopted, since when the vehicle is not in motion, the shift lever locks in "park" at the moment the ignition key is turned to the "OFF" position. In both its docket comment and its petition for reconsideration, Nissan requested that S4.3 be amended by applying the provision only "while the vehicle is in motion."

Toyota voiced similar concerns about potential compliance problems of its shift lock system with S4.3. It explained that for some of its vehicles, if the transmission shift lever has already been placed in "park" before the engine is shut off, turning off the ignition does activate the shift lock. Since Toyota believed that locking the transmission only poses a potential safety concern while the vehicle is in motion, it suggested that S4.3 be amended to include the phrase "unless an automatic transmission shift lever is in 'park'."

Upon reconsideration, NHTSA has decided that the provision in the final rule was overly broad because there are no safety benefits obtained by applying S4.3 to stationary vehicles. Further, prohibiting transmission lock systems in which the lock is activated while the transmission is in park might pose potentially burdensome compliance problems on some manufacturers. Accordingly, the agency has decided to modify Standard No. 114 so that S4.3 does not apply when automatic transmission vehicles are in "park."

Leadtime

The final rule provided over two years of leadtime to comply with the amendments. In its petition for reconsideration, Nissan asked for another year of leadtime before the amendments became effective, claiming that it would have to redesign substantially its systems if the agency rejected its requested amendments. After reviewing this issue in light of this notice's amendments giving manufacturers greater design flexibility, NHTSA concludes that the existing two-year leadtime is appropriate. The agency believes that manufacturers will not have to undertake extensive revisions to their systems to comply with Standard No. 114. For the most part, the agency anticipates that, at most, manufacturers of electrical transmission shift systems will typically only have to modify the electrical solenoid's circuitry or redesign the transmission console and area near the ignition key to include a plastic cover over the emergency devices. The agency thus does not anticipate the need for any extensive retoolings or redesigns. Accordingly, the agency has determined that the effective date of September 1, 1992 continues to be appropriate for this rulemaking.

Costs

In its petition for reconsideration, Rover Group stated that NHTSA did not consider the cost impact of the rulemaking, especially in terms of requiring a mechanical linkage system to vehicles with a console mounted key-locking system. The agency disagrees that the agency failed to consider the rulemaking's cost impact given the Final Regulatory Evaluation's detailed analysis of the rulemaking's cost implications. The agency further notes that Rover Group was under the apparent misconception that the amendments would necessitate a mechanical linkage. As evidenced by systems developed by other manufacturers, there are other, less costly ways to comply with Standard No. 114, as amended.

Rulemaking Analyses and Notices
Executive Order 12291 (Federal Regulation) and DOT Regulatory Policies and Procedures

NHTSA has analyzed this notice responding to the petitions for reconsideration to the amendments to Standard No. 114 and determined that it is not "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. For the final rule, the agency prepared a Final Regulatory Evaluation (FRE) which provides the details of the cost and benefit estimates, and a copy of the FRE was placed in the docket. Those estimates are essentially unchanged by these amendments. As explained in the final rule, the agency anticipated the costs of this rulemaking to be between $3.2 million and $6.6 million. The amendments adopted in this notice should not increase these costs and may result in minor cost savings because potential compliance problems should be reduced. As explained in this notice's section on safety need, the agency has estimated that there are roughly 400 to 800 relevant injury-producing transmission lever shifting accidents each year nationwide. Installation of the required technology in the cars and light trucks not voluntarily equipped by the rule's effective date, will prevent an estimated 50 to 100 child-injuring rollaway accidents annually.

S1 is revised to read as follows:

S1 **Purpose and Scope**. This standard specifies requirements primarily for theft protection to reduce the incidence of crashes resulting from unauthorized operation of a motor vehicle. It also specifies requirements to reduce the incidence of crashes resulting from rollaway of parked vehicles.

S4.2 is revised to read as follows:

S4.2 Each vehicle shall have a key-locking system which, whenever the key is removed, prevents:

(a) the normal activation of the vehicle's engine or motor; and

(b) either steering or forward self-mobility of the vehicle or both.

S4.2.1 Except as provided in S4.2.2(a) and (b), the key-locking system required by S4.2 in each vehicle which has an automatic transmission with a "park" position shall prevent removal of the key unless the transmission or transmission shift lever is locked in "park" or becomes locked in "park" as the direct result of removing the key.

S4.2.2 (a) Notwithstanding S4.2.1, each vehicle specified therein may have a device which, when activated, permits key removal provided that steering is prevented upon the key's removal. The means for activating the device shall be covered by a non-transparent surface which, when installed, prevents sight of and activation of the device and which is removable only by use of a screwdriver or other tool.

(b) Notwithstanding S4.2.1, each vehicle specified therein may have a device which, when activated, permits moving the transmission shift lever from "park" after the removal of the key provided that steering is prevented when the key is removed. The means for activating the device may be operable by the key, as defined in S3. The device may be operable by another means which is covered by a non-transparent surface which, when installed, prevents sight of and activation of the device and which is removable only by use of a screwdriver or other similar tool.

S4.3 is revised to read as follows:

S4.3 Except when an automatic transmission vehicle is in "park," the means for deactivating the vehicle's engine or motor shall not activate any device installed pursuant to S4.2(b) to prevent the vehicle's steering or forward self-mobility or both.

Issued on March 20, 1991

Jerry Ralph Curry
Administrator

56 F.R. 12464
March 26, 1991

MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection—Passenger Cars

(Docket 1-21; Notice 5)

S1. Purpose and scope. This standard specifies requirements for theft protection to reduce the incidence of accidents resulting from unauthorized operation of a vehicle. [It also specifies requirements to reduce the incidence of crashes resulting from rollaway of parked vehicles. **56 F.R. 12464—March 26, 1991. Effective: September 1, 1992)]**

S2. Application. This standard applies to passenger cars and to trucks and multipurpose passenger vehicles having a GVWR of 10,000 pounds or less.

S3. Definitions. "Combination" means one of the specifically planned and constructed variations of a locking system which, when properly actuated, permits operation of the locking system.

"Key" includes any other device designed and constructed to provide a method for operating a locking system which is designed and constructed to be operated by that device.

"Vehicle type" refers to "passenger car," "truck," or "multipurpose passenger vehicle," as those terms are defined in 49 CFR §571.3.

S4. Requirements.

S4.1. Each truck and multipurpose passenger vehicle having a GVWR of 10,000 pounds or less manufactured on or after September 1, 1983 and each passenger car shall meet the requirements of S4.2, S4.3, S4.4, and S4.5. However, open-body type vehicles that are manufactured for operation without doors and that either have no doors or have doors that are designed to be easily attached to and removed from the vehicle by the vehicle owner are not required to comply with S4.5.

S4.1.1 Passenger cars manufactured before September 1, 1982, shall meet the requirements of S4.2, S4.4, S4.6, and S4.7 or the requirements listed in S4.1.2.

S4.1.2 Passenger cars manufactured on or after September 1, 1982, shall meet the requirements of S4.3, S4.5, S4.6, and S4.7.

S4.1.3 Trucks and multipurpose passenger vehicles having a GVWR of 10,000 pounds or less manufactured on or after September 1, 1983, shall meet requirements of S4.3, S4.5, S4.6, and S4.7.

S4.2 Each vehicle shall have a key-locking system which whenever the key is removed, prevents:

(a) The normal activation of the vehicle's engine or motor; and

(b) either steering or forward self-mobility of the vehicle, or both.

[**S4.2.1.** Except as provided in S4.2.2(a) and (b), the key-locking system required by S4.2 in each vehicle which has an automatic transmission with a "park" position shall prevent removal of the key unless the transmission or transmission shift lever is locked in "park" or becomes locked in "park" as the direct result of removing the key.

S4.2.2(a) Notwithstanding S4.2.1, each vehicle specified therein may have a device which, when activated, permits key removal provided that steering is prevented upon the key's removal. The means for activating the device shall be covered by a non-transparent surface which, when installed, prevents sight of and activation of the device and which is removable only by use of a screwdriver or other tool.

(b) Notwithstanding S4.2.1, each vehicle specified therein may have a device which, when activated, permits moving the transmission shift lever from "park" after the removal of the key provided that steering is prevented when the key is removed. The means for activating the device may be operable by the key, as defined in S3. The device may be operable by another means which is covered by a non-transparent surface which, when installed, prevents sight of and activation of the device and which is removable only by use of a screwdriver or other similar tool. **(56 F.R. 12464—March 26, 1991. Effective: September 1, 1992)]**

S4.3 [Except when an automatic transmission vehicle is in "park," the means for deactivating the vehicle's engine or motor shall not activate any device installed pursuant to S4.2(b) to prevent the vehicle's steering or forward self-mobility or both. **(56 F.R. 12464—March 26, 1991. Effective: September 1, 1992)]**

S4.4 For each vehicle type manufactured by a manufacturer, the number of different combinations of the key-locking systems required by S4.2 shall be at least 1,000, or a number equal to the number of vehicles of that type manufactured by such manu-

facturer, whichever is less. The same combinations may be used for more than one vehicle type.

S4.5 A warning to the driver shall be activated whenever the key required by S4.2 has been left in the locking system and the driver's door is opened. The warning to the driver need not operate—

(a) After the key has been manually withdrawn to a position from which it may not be turned;

(b) When the key-locking system is in the "on" or "start" position; or

(c) After the key has been inserted in the locking system and before it has been turned on.

S4.6 The number of different combinations of the key-locking systems required of each manufacturer for a type of vehicle shall be at least 1,000, or a number equal to the number of vehicles of that type manufactured by such manufacturer, whichever is less.

S4.7 A warning to the driver shall be activated whenever the key required by S4.2 or S4.3 has been left in the locking system and the driver's door is opened. The warning to the driver need not operate—

(a) After the key has been manually withdrawn to a position from which it may not be turned;

(b) When the key-locking system is in the "on" or "start" position; or

(c) After the key has been inserted in the locking system and before it has been turned.

Issued on December 22, 1980

45 F.R. 85450
December 29, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 89-18; Notice 3)
RIN: 2127-AC 14

ACTION: Final rule.

SUMMARY: This notice makes final an amendment to Federal Motor Vehicle Safety Standard (FMVSS) No. 205, Glazing Materials, specifying specimen clamping of Item 14 glass-plastic glazing (glazing with one or more layers of glazing and a layer of plastic on the surface facing the vehicle interior) for Test 26. In Test 26, a 5-pound ball is dropped onto specimens of glazing to determine whether the glazing material has satisfactory penetration resistance. No clamping is specified for conducting Test 26 on Item 1 glazing. Item 1 glazing is similar to Item 14 glazing, except the former has no plastic layer on the inside surface. This notice does not adopt the proposal in the notice of proposed rulemaking to specify clamping of Item 14 glazing in two other drop tests, Test 9 (that determines the behavior of the safety glazing under impact from a small, hard object) and Test 12 (that determines whether the safety glazing has a certain minimum strength and is properly made). The agency also is not adopting a proposal to prohibit the installation of strengthened glass-plastic glazing in windshields and other locations requisite for driving visibility.

EFFECTIVE DATE: The amendments in this rule are effective September 23, 1991.

SUPPLEMENTARY INFORMATION:

I. Background

FMVSS No. 205 specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment. The standard incorporates by reference, American National Standard (ANSI) Z26.1, "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," as amended through 1980 (Z26). FMVSS No. 205 provides performance specifications for 14 types (known as "items") of safety glazing materials and the locations in which they may be installed in motor vehicles. To ensure compliance, specimens of each item of glazing material are subjected to a selected group of tests, as appropriate for the general use of the material.

The agency first allowed use of glass-plastic safety glazing in 1983, when Item 14 glazing was added to FMVSS No. 205. NHTSA amended FMVSS No. 205 to permit the use of Item 14 glass-plastic glazing in all glazing areas, including the windshield, because the glazing had the ability to reduce the risk of lacerative injuries in crashes. (See 48 FR 52061, November 16, 1983.) This item consists of glass on the outside surface and plastic on the inside surface. In adding Item 14, the agency anticipated that this type of glazing would consist of laminated glass to which a plastic layer was added on the inside surface. However, it is possible to manufacture the item with or without laminated glass. For example, Item 14 could consist of the current high penetration resistant (HPR) three-ply glazing to which one or more layers of plastic have been added to create a windshield of four or more plies or it may simply consist of a single sheet of glass to which a layer of plastic has been added to the surface (two-ply glazing). The first generation of glass-plastic was found to be costly and when used, was limited to use in windshields.

By letter dated July 24, 1986, General Motors Corporation (GM) stated that the current test procedure for penetration resistance is not an appropriate method for two-ply glass-plastic glazing. Test number 26 (in Z26) consists of dropping a 5-pound steel ball onto a 12 inch by 12 inch glass specimen from a height of 12 feet. The specimen is centered on the top of a 17 3/8 inch square wooden frame with an 11 3/8 inch square opening. A specimen is deemed to have failed if the ball passes "through" it. For traditional three-ply HPR glazing, the nonaligned cracks in the inner and outer layers of glass, resulting from impact with the ball, provide the specimen sufficient rigidity to remain in

the test fixture. GM reported that the two-ply specimen, which is more flexible, is pushed through the frame by the ball without being penetrated by it.

Since there is no specific prohibition in FMVSS No. 205 against clamping the specimen during testing, GM requested an interpretation of FMVSS No. 205, to allow restraint of the test sample in the test fixture for Test Number 26. By letter dated May 27, 1987, NHTSA's Office of Chief Counsel responded that the agency could not adopt this change in the test procedure through issuing a letter of interpretation. The agency stated that in order to address the problem and to ensure objectivity, it would be necessary to amend the standard to establish uniform requirements for providing additional support to two-ply glazing materials during the drop test. Accordingly, the GM letter was treated as a petition for rulemaking and the petition was granted.

The agency published a Notice of Proposed Rulemaking (NPRM) on October 11, 1989 (54 FR 41636). The NPRM proposed amending FMVSS 205 by specifying specimen clamping of Item 14 glass-plastic glazing for Test 26. Additionally, the notice requested comments on the advisability of extending the clamping procedure to two other drop tests, Test 9 and Test 12. All three of these tests, 26, 9, and 12, are usually performed on laminated glazing, including laminated glass-plastic glazing (Item 14). Test 9 is a drop test in which a 7-ounce round-nosed dart is dropped from 30 feet. This test measures the resistance to impact by a small hard object. Test 12 involves the dropping of an 8-ounce steel ball from a height of 30 feet to determine whether the safety glazing has a certain minimum strength and is made properly. In order to pass Test 12, the ball must not pass through the specimen. Further, "at the point immediately opposite the point of impact, small fragments of glass may leave the specimen, but the small area thus affected shall expose less than 1 square inch of reinforcing or strengthening material, the surface of which shall always be well covered with tiny particles of tightly adhering glass." In addition, the glass may not delaminate from the plastic.

In the NPRM, the agency also proposed prohibiting laminated glass that is "strengthened by any method" from being used in "glass-plastic glazing in any windshield or other location requisite for driving visibility." This restriction was motivated by the agency's concern that the glass remaining adhered to the plastic would obscure visibility. Glass "strengthened by any method," when broken, tends to break up into cubes. When the strengthened glass layer of laminated glazing breaks, the glass often remains adhered to the plastic layer, thus obscuring the view through the glazing.

II. Public Comments to the NPRM

Following its publication of the NPRM, the agency received comments from PPG, Chrysler Motors Corporation, Flachglas AG, Ford Motor Company, General Motors (GM), Motor Vehicle Manufacturers of America (MVMA), the Insurance Institute for Highway Safety (IIHS), Monsanto, and the Flat Glass Association of Japan (FGAJ). The following is a summary of the issues, the principal comments, and the agency's analysis of the issues and comments.

A. Clamping Specimens for Test 26

Numerous issues were addressed in the NPRM concerning this proposed amendment to the test procedure. The most critical were: Should the glazing be clamped? Would clamping either add to or detract from the safety of laminated glazing? Should the clamping be an option? Are there any cost and weight benefits to two-ply glazing? These issues were discussed extensively in the preamble to the NPRM.

Most commenters concurred in general with the agency proposal to specify clamping of test specimens of glass-plastic glazing. However, GM opposed making the test procedure a requirement for glass-plastic glazing. GM stated that clamping increases the stringency of the penetration test beyond a necessary level. GM recommended clamping be an option to be used when necessary to retain the specimen in the test fixture.

For the following reasons, the agency has decided to amend FMVSS No. 205 to specify the clamping of glass-plastic specimens each time the agency conducts Test 26 on Item 14 glazing. Most practical designs of windshield glazing will easily pass the drop test while unclamped. Since two-ply glazing lacks the inherent rigidity of three-ply HPR glazing, the penetration resistance of the two-ply glazing is dependent upon the combined contribution of the glass and plastic layers. However. the plastic layer of a test specimen of two-ply glass/plastic glazing can make its contribution only if the specimen is clamped. When a specimen of that glazing is held rigid by means of clamping, the force of the falling ball is concentrated at the point of impact, and tests the impact resistance of not only the glass layer but also the plastic layer. If the specimen is unclamped, the ball will simply break the glass, flex the plastic, and push it through the test frame. A decision not to specify clamping would have the undesirable effect of allowing and possibly even encouraging manufacturers to increase the penetration resistance of two-ply glass/plastic glazing by increasing the thickness of the glass layer. A thicker layer of glass in glass-plastic glazing would create safety problems because the thicker glass would tend to increase the forces to which an occupant's head or other body part is subject in a crash before the glass breaks, and therefore would increase the potential for injuries. In addition, GM

stated that thicker glazing "can add significantly to the weight of a door which would influence the door mounting system design, overall vehicle mass, and fuel economy."

The agency notes that clamping specimens for the purpose of conducting Test 26 will be done only with Item 14 glass-plastic material. Instead of using Item 14 glazing, manufacturers will be able to use Item 1 glazing also, which has the rigidity and penetration resistance necessary to meet Test 26 without being clamped.

B. Clamping for Tests 9 and 12

Clamping for Tests 9 and 12 was proposed in the NPRM because the agency was concerned that clamping may be necessary to properly conduct these tests for glass-plastic two-ply specimens. However, due to the lack of industry experience with two-ply material, this need may not have been evident to industry and commenters when it was raised by this agency in the NPRM.

At the same time, the agency was concerned that since different types of glazing are defined by their ability to pass specific performance tests, specifying clamping during these two drop tests for windshield glass-plastic might inadvertently make it possible for manufacturers to qualify, for use as certain types of glazing, materials that may have some unforeseen adverse effect on occupant safety. For example, clamping might make it possible for tempered glass-plastic windshields to pass Tests 9 and 12. In order to get a better idea of the advantages and disadvantages of clamping for Tests 9 and 12, the agency proposed clamping all glass-plastic specimens for these two tests, in addition to clamping Test 26, and asked two questions concerning this proposal. The first question, identified in the NPRM as Question 1, was: "Is clamping of the test specimens in Test 9 and/or 12 necessary?" The second question, identified in the NPRM as Question 2, asked: "What would be the effect on the specimen design if Tests 9 and/or 12 required clamping?"

PPG, Flachglas, Libbey-Owens-Ford (LOF), and the Flat Glass Association of Japan (FGAJ) stated clamping was not necessary to conduct Test 9 and Test 12. Flachglas stated that the upper frame of the proposed ECE-type test fixture would be sufficient to hold specimens for Tests 9 and 12. Ford and the MVMA, on the other hand, supported the proposal to clamp specimens for the purpose of conducting Test 9 and Test 12. Ford indicated that they experienced a problem with complying with Tests 9 and 12. Ford stated that when conducting Tests 9 and 12, it had "on occasion" experienced cases of developmental two-ply glass-plastic specimens falling through the test frame when unclamped. The MVMA urged clamping of glass-plastic in Tests 9 and 12 to eliminate any need to amend this standard at a later time. Chrysler suggested clamping of Tests 9 and 12 be optional, "where needed to ensure that the specimen does not move in these tests." GM recommended that the agency "review comments from the glazing manufacturers who are more qualified to comment on the need for clamping for these tests." Monsanto stated that more data were needed to answer the issues raised in clamping Tests 9 and 12.

In issuing the NPRM, the agency was concerned that clamping may be necessary for Tests 9 and 12 on glass-plastic two-ply specimens. However, it was also concerned that specifying clamping in these two remaining drop tests may have the unintended effect of modifying the performance requirements of the glazing, thus allowing use of materials such as tempered glass that may result in glazing designs that would create obscured vision when broken. Although the agency's concerns about the unintended effects of specifying clamping were not confirmed by the public comments, NHTSA has decided not to adopt the clamping procedure for Tests 9 and 12 in this final rule. Its review of the public comments on these issues failed to yield any data that would strongly support the necessity for clamping either Test 9 or 12. Ford neither specified the frequency of its problems nor provided information that would explain why the material tested by Ford, but not the material tested by other manufacturers, was forced through the test frame. Further, the original petitioner, General Motors, did not request clamping for Tests 9 and 12. For all of these reasons, amending these tests is not warranted at this time. The agency seeks more specific information about the types of glazing that may have trouble passing Tests 9 and 12.

C. Prohibition of Strengthened Glass-Plastic Glazing

In the NPRM, the agency proposed to prohibit glass "that is strengthened by any method" from being used in "glass-plastic glazing in any windshield or other location requisite for driving visibility." This prohibition was proposed to prevent inadvertently allowing the inclusion of tempered glass-plastic in areas requisite for driving visibility as a result of the modification of the test procedures and therefore a modification of the performance requirements. In the NPRM, the agency expressed concern that a tempered glass-plastic windshield, when broken, would instantly obscure driver vision.

To focus comments on this issue, the NPRM raised two questions. The first question was posed in the NPRM as Question 3: "Would modifying Test 26 inadvertently permit use of tempered glass-plastic in windshields?" The second question, posed as Question 4 asked: "What are the advantages or disadvantages of tempered glass-plastic in windshields, or the side and rear windows?"

Most of the commenters were opposed to the prohibition in some form or another. The commenters on this issue included PPG, Chrysler, Ford, Flachglas, GM, MVMA, IIHS, Monsanto, and FGAJ. In general, the public comments made a distinction between allowing tempered glass-plastic glazing in windshields and allowing such glazing in all other glazing locations requisite for driving visibility. PPG recommended against using "tempered components in glass-plastic glazing for use in windshields," but stated that restrictions in other glazing areas "will severely limit forseeable and needed design trends in the automotive industry." They stated that prohibition would result in numerous problems, among which were: costly body redesign to compensate for loss of strength; shape and mounting restrictions; hindrance of innovative design prohibition of most current processing techniques; and a higher breakage rate for annealed glass. PPG stated that broken side and rear glass would not obscure vision necessary for bringing a vehicle to a safe stop. Finally, PPG stated that the definition of "strengthened by any method" would eliminate the use of even annealed glass as well as tempered glass in glass-plastic glazing. PPG's point apparently is that as glass is formed into sheets, it undergoes final processing in one of two ways. It is either reheated and cooled slowly, creating "annealed glass," or is toughened thermally or chemically, creating "tempered glass." Because the process by which annealed glass is created strengthens the glass, PPG believes the term "strengthened by any method" would encompass the annealing process. PPG said that the "forming process used in the manufacturing of annealed glass does impart some residual stresses, particularly near the edges of the glazing."

Chrysler opposed the prohibition against strengthened glass-plastic in the windshield or other locations requisite for driving visibility. Chrysler pointed out that for many years they used strengthening around the periphery of the windshield to minimize breakage.

Ford was more specific as to the reasons for its opposition, stating that the prohibition would prohibit the current processing of the peripheral region of windshields to reduce breakage. This is apparently because processing of the edges of the glazing is "strengthening" the edge, a practice that was proposed to be prohibited in the NPRM. They further stated that the tempered glass-plastic prohibition would discourage development of new techniques for strengthening. Ford asserted that broken tempered glass-plastic does not curtail visibility. Ford also stated that annealed glass-plastic is undesirable since severe lacerations would result when the plastic was penetrated. Ford stated that annealed glass has only 25 percent the strength of tempered glass, and that since it is more likely to break, it is more likely to cut. Ford stated that annealed glass would have to be about four times thicker (approaching ½ an inch) and four times heavier than tempered glass to be as strong.

GM opposed the proposed prohibition against the use of tempered glass-plastic glazing in non-windshield locations requisite for driving visibility. All its comments on the benefits of tempered glass-plastic glazing were limited to areas other than the windshield. GM stated that tempered glass would have a higher strength-to-weight ratio, lower frequency of laceration and greater consumer satisfaction. As for the agency's concern with tempered glass-plastic glazing that vision can be influenced when diced pieces of shattered tempered glass would remain laminated to the plastic and would obscure vision, GM asserted that broken glass is not common. Additionally, GM stated that the window could be rolled down, could still be seen through, and would be no worse than trash bags, cardboard, or duct tape. GM asserted that by prohibiting tempered glass, the only remaining material authorized for use in motor vehicles is untempered, annealed glass. Using annealed glass rather than tempered glass would necessitate using a thicker glass to attain the same amount of strength as tempered glass, which can add significantly to the weight of a door and would influence the door mounting system, overall vehicle mass, and would reduce fuel economy.

The MVMA opposed the prohibition of tempered glass-plastic glazing, not making a distinction between the windshield and other glazing areas. It raised concerns expressed by other commenters such as the fact that current windshields use compressive stresses on the periphery, the prohibition would preclude future designs, annealed glass is not strong enough and would require new mounting for movable windows, tempered glass would outperform annealed laminated glass, with reduced replacement costs, and that visibility would not be impaired.

The IIHS favored the prohibition of tempered glass-plastic for windshields. But for side glazing, it suggested that NHTSA continue to collect data. They suggested tempered glass-plastic on side windows would not be as subject to breakage, and that the visibility concerns immediately after the breakage would not be so critical as in the case with windshields. IIHS stated that tempered and annealed side glass-plastic would reduce lacerations and contribute to containing occupants in side impacts and rollover crashes.

Monsanto opposed the prohibition of strengthened glass-plastic in areas requisite for driving visibility.

The FGAJ said that in the windshield, visibility could possibly be blocked and ejection mitigation would not be as effective with tempered two-ply. But for side and rear glazing, FGAJ stated that ejection mitigation and laceration protection would be greater than with the current single layer of tempered glass. They stated the only disadvantage would be loss of visibility, but not to the degree that it would hinder driving. FGAJ also discussed performance tests that would result in being able to disinguish between tempered and nontempered glass/plastic glazing. They tried a frag-

mentation test, a dart impact test, a strength test and an internal stress test. FGAJ concluded that none of these methods would provide a practical test procedure.

The agency believes the arguments provided by commenters for continuing to allow tempered (or strengthened) glass-plastic in side and rear glazing are compelling. The prohibition against tempered glass-plastic glazing would restrict processes that are used in manufacturing windshields today. Further, a broad prohibition against strengthened glazing may prohibit current windshield strengthening techniques for annealed laminated glazing. This would have an adverse effect on glass technology, automotive safety, and cost benefits for consumers.

The agency has reconsidered the former position that use of tempered glass in laminated glass-plastic glazing could seriously compromise visibility through broken side and rear glass-plastic glazing. It is now believed that safety concerns over the potential for the heavier and thicker non-tempered glazing to cause injuries in crashes outweigh concerns over the potential for crashes as a result of lessened visibility through broken side and rear glazing. The extent to which visibility would be compromised by broken side and rear glazing is still unknown. Saint Gobain Vitrage, in its comments to the concurrent glazing docket concerning creation of Item 15 and Item 16 glazing (54 FR 41632, October 11, 1989) reported that as much as 99 percent of broken side glass was attributable to burglary while the vehicles were stationary. Saint Gobain Vitrage gathered this information through informal contacts with insurance companies. Breaking of side and rear glazing during a burglary attempt does not create a sudden visibility hazard for the driver of a moving vehicle.

While the agency continues to be concerned about the possibility that a broken tempered glass windshield could create a significant visibility hazard, it recognizes that a broken tempered glass-plastic windshield would not cause a complete loss of visibility. Examination of broken tempered glass-plastic reveals partial visibility. We believe that this partial visibility would be sufficient in most cases to bring the vehicle to a safe stop.

Further, the agency has been unable to identify an objective test procedure that would distinguish tempered from nontempered glass and not prohibit strengthening methods that are currently in use in motor vehicle windshields. This means that there is no practical means of enforcing the prohibition against tempered glass-plastic. Even if the agency wished to take the approach of measuring the amount of visibility obscured by the broken glass, the agency knows of no test procedure to measure the amount of visibility that would be lost through broken glass.

For these reasons, in this final rule, the agency is not adopting the prohibition against use of glass that is "strengthened by any method" from being used in glass-plastic glazing "in any windshield or other location requisite for driving visibility."

D. Test Fixture

In the NPRM, the agency proposed adopting a different test fixture for holding and clamping glass-plastic test specimens than the one currently specified for Test 26. The proposed fixture was an adaptation of the test fixture used in the Economic Commission of Europe (ECE) glazing regulation R43. The agency proposed using the ECE R43 test fixture because it would partially harmonize FMVSS No. 205 with ECE R43. In addition, it would not necessitate the extensive fixture redesign and testing modification by testing laboratories or concerns that would be necessary with the FMVSS No. 205 wooden test fixture. The agency asked for comments concerning the objectivity of the proposed test device.

All commenters supported using the proposed test fixture, and were quite receptive to the idea of the agency specifying the use of the proposed test fixture, which would harmonize with the ECE R43 test fixture. The proposed test fixture was reported to be appropriate for the glass-plastic drop test fixture, using clamped specimens. Therefore, the agency adopts in the final rule, the proposed ECE R43 test fixture illustrated in Figure I of the NPRM.

E. Use the Proposed ECE Test Fixture for All Drop Tests

Although not proposed by the agency in the NPRM, Flachglas recommended using the proposed test fixture for all drop tests, not just the clamped glass-plastic drop test (Test 26). The additional tests that would be affected by this proposal would be the nine tests used to verify specific characteristics for tempered glass, Tests 6, 7, 8, 9, 10, 11, 12, 13, and 14. Flachglas did not suggest clamping for these additional tests, only that this single fixture should be used for each test. These drop tests are used for other materials such as tempered glass or rigid plastic, and apply other performance criteria to these glazings.

The agency is not adopting the ECE test fixture for all drop tests. The agency did not propose or discuss such an amendment in the NPRM. Consequently, there has been no opportunity for affected parties to comment on the use of the single fixture. Additionally, Flachglas did not cite a specific safety need to use the ECE test fixture for all drop tests, and the agency is unaware of any such need.

F. Effective Date

In the NPRM, the agency proposed the clamping test procedure amendment be effective immediately. The agency's position was that because this amendment appeared to be a clarification of the test procedure, and would not entail any redesign of materials, the rule should be effective immediately.

PPG suggested the effective date of this rulemaking be delayed at least 90 days from the publication of the final rule. They argued that this would permit companies that did not currently have this test fixture to obtain the fixture and make any changes. They also pointed out that the ECE fixture does not have specific provisions for a clamping technique; the clamping procedure will have to be developed.

The agency concurs with the PPG comment. The agency is not aware of any manufacturer that is currently using glass-plastic glazing as original equipment, nor is there any indication that glass-plastic will be used in the near future. However, the agency wishes to encourage manufacturers to use glass-plastic and believes removing test barriers for two-ply glass-plastic may encourage its use. Therefore, the agency has decided that the clamping procedure and test fixture will be effective 180 days after publication of this final rule. After the effective date, the agency will clamp the test specimens of glazing each time the agency conducts Test 26 on Item 14 glazing.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 205, *Glazing materials* (49 CFR 571.205), is amended to read as follows:

The introductory text to existing paragraph S5.1.2.4 is revised to read as follows:

S5.1.2.4 *Item 14—Glass Plastics.* Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.5 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), (d), and (e) of this paragraph, may be used anywhere in a motor vehicle. except that it may not be used in convertibles, in vehicles that have no roof or in vehicles whose roofs are completely removable.

Paragraph (e) is added after paragraph (d) of S5.1.2.4 as follows:

(e) The glass-plastic glazing specimen tested in accordance with Test No. 26 shall be clamped in the test fixture in Figure 1 of this standard in the manner shown in that figure. The clamping gasket shall be made of rubber 3 millimeters (mm) th1ck of hardness 50 IRHD (International Rubber Hardness Degrees), plus or minus five degrees. Movement of the test specimen, measured after the test, shall not exceed 2 mm at any point along the inside periphery of the fixture. Movement of the test specimen beyond the 2 mm limit shall be considered an incomplete test, not a test failure. A specimen used in such an incomplete test shall not be retested.

Figure 1 is added at the end of Federal Motor Vehicle Safety Standard No. 205.

Issued on: March 20, 1991.

Jerry Ralph Curry
Administrator

56 F.R. 12464
March 26, 1991

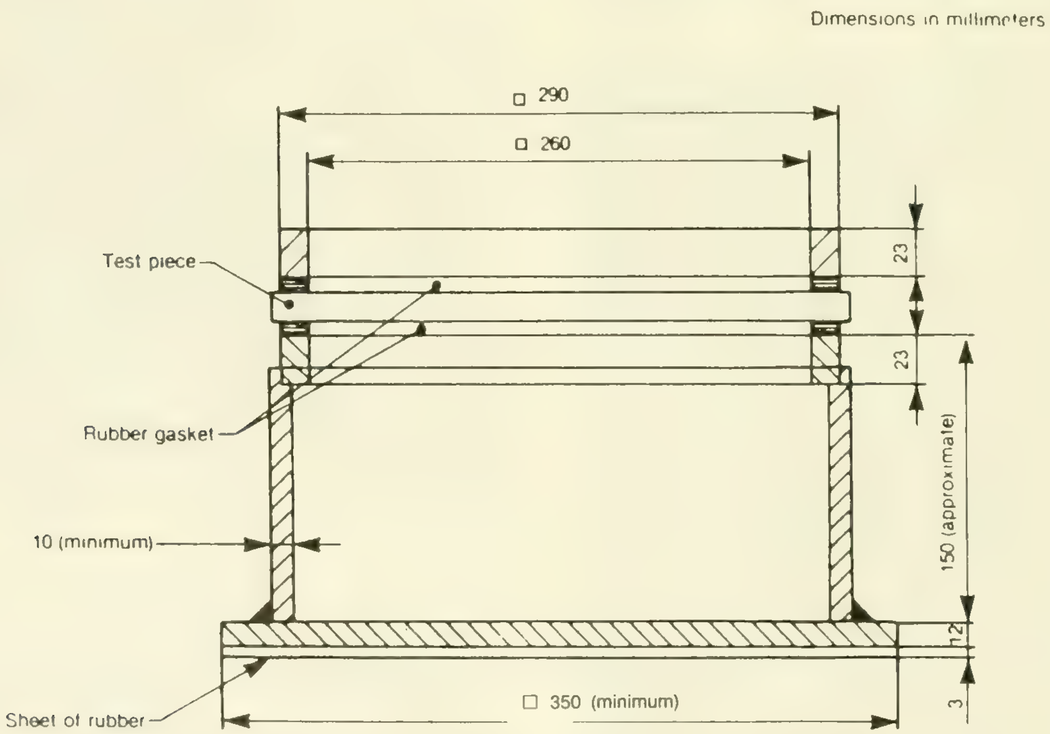


Figure 1—Test Fixture for Clamped Specimens

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 89-18; Notice 4)
RIN: 2127-AC38

ACTION: Final rule.

SUMMARY: This rule amends Standard No. 205, *Glazing Materials*, to permit three new items of glass-plastic glazing. Item 15A, annealed glass-plastic glazing, is permitted to be used anywhere in a motor vehicle except the windshield. Item 16A, annealed glass-plastic glazing, and Item 16B, tempered glass-plastic glazing, may be used in areas not requisite for driving visibility. The agency believes that the addition of these three new types of glazing to Standard No. 205 will facilitate use of glass-plastic glazing in all glazing locations in a motor vehicle. The agency encourages greater use of glass-plastic glazing because of its proven injury-reduction capabilities in crashes. This notice also makes certain technical changes to Standard No. 205.

A supplementary notice of proposed rulemaking (SNPRM) to amend Standard No. 205, published elsewhere in today's edition of the *Federal Register*, proposes to permit a new Item 15B, Tempered glass-plastic glazing, for all areas requisite for driving visibility except the windshield. The SNPRM also requests further public comments, especially data, on the question of deleting Test No. 1 for Item 3 glazing.

DATES: The amendments in this rule are effective May 23, 1991.

SUPPLEMENTARY INFORMATION:

I. Background

Federal Motor Vehicle Safety Standard No. 205, *Glazing Materials* (49 CFR 571.205), specifies performance requirements for the types of glazing that may be used in motor vehicles. It also specifies the vehicle locations in which the various types of glazing may be used. The standard incorporates, by reference, American National Standard Institute (ANSI) Standard Z26.1, "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," as amended through 1980 (ANS Z26). The requirements in ANS Z26 are specified in terms of performance tests that the various types or "items" of glazing must pass. There are 14 "items" of glazing for which requirements are currently specified in Standard No. 205.

To ensure the safety performance of vehicle glazing, Standard No. 205 includes a total of 32 specific tests. Each item of glazing is subjected to a selected group of these tests appropriate for that material. It is the particular combination of tests that dictates the requisite properties of a particular item of glazing, and where in a motor vehicle it may be used. For example, three-ply laminated windshield glazing, Item 1, usable anywhere in a vehicle including the windshield, is subjected to nine tests.

Item 14 (glass-plastic glazing) was added to Standard No. 205 by NHTSA in 1983 (48 FR 52061), without limitation as to the location of its use in a motor vehicle. Item 14 glazing was anticipated to be used primarily in vehicle windshields. In adding Item 14, the agency anticipated that this type of glazing would consist of laminated glass to which a plastic layer was added on the inside surface, facing the interior of the vehicle.

Although there are currently no items of glass-plastic glazing allowed only in areas other than the windshield, there are two main types of nonglass-plastic glazing allowed for use in these areas. Item 2 glazing may be used anywhere in a motor vehicle except windshields. The windows to the left and right of the driver in all vehicles and rearward windows in passenger cars can be made of Item 2 glazing. Item 3 glazing may be used anywhere in a motor vehicle except windshields and other areas requisite for driving visibility. Item 3 is used as side-facing rearward windows of light trucks, vans, and multipurpose passenger

vehicles and also for sun roofs and T-tops. Both items 2 and 3 may be manufactured in one of four types of construction: laminated glass, tempered glass, and 2 classes of multiple glazing units. The primary difference between Item 2 and Item 3 glazing is that Item 3 is not subject to any luminous transmittance requirements.

The agency granted a petition from the Taliq Corporation (petitioner) requesting that the agency amend Standard No. 205 by creating a category of glass-plastic glazing without the visibility requirements or the stringent anti-penetration requirements applicable to Item 14. In the notice of proposed rulemaking (54 FR 41632, October 11, 1989) that was subsequently issued, the agency proposed to permit three new items of glass-plastic glazing. The new glass-plastic designated as Item 15, annealed glass-plastic, would meet the same requirements as Item 2, with the addition of requirements applicable to plastics. The agency proposed that the new Item 15 be permitted for use in the locations specified for Item 2, that is, in all locations except for the windshield. The agency did not propose a tempered version of Item 15, because of its concern about potential visibility problems when the glass is shattered. Public comment was solicited on whether the agency should allow tempered glass to be used in glass-plastic glazing in areas requisite for driving visibility. In particular, comment was sought on whether the extra protection offered by tempered glass in side-impact situations would outweigh visibility impairment created when tempered glass fragments are held in position on the plastic layer, blocking the driver's sideward vision. The agency also sought comment on whether prohibition of tempered glass-plastic glazing would unnecessarily hinder innovation or design flexibility.

The agency also proposed that Items 16A, annealed glass-plastic, and 16B, tempered glass-plastic, be allowed in the locations specified for Item 3, that is, in all locations not requisite for driving visibility. Both annealed and tempered glazing would be allowed for Item 16 since laminated tempered glass-plastic would not present a visibility problem upon breakage in areas not requisite for driving visibility. In the NPRM, the agency described in detail the need for these new items of glazing, emphasizing the agency's hope that greater use of glass-plastic at side and rear locations would result in ejection mitigation and laceration reduction, in the event of crashes.

In the NPRM, the agency further proposed three technical changes to Standard No. 205. First, NHTSA proposed deletion of the Light Stability Test No. 1, for Item 3 glazing. The rationale for the proposal was that since Item 3 glazing is not used in areas which require driving visibility, a visibility test would not provide any increased degree of safety. Next, the agency proposed an amendment to the Fragmentation Test No. 7, to require a maximum length-to-width ratio of 3-to-1 and a maximum length of 2 inches for glass fragments resulting from the test. This proposal was intended to prohibit long, thin pieces of tempered glass from being produced after the shattering of glass. Finally, the agency proposed to clarify the definition of gasoline, as was recently done in Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment.* Gasoline is used in a submersion test in Standard No. 205.

II. Public Comments to the NPRM

Comments were received from PPG Industries, Inc. (PPG), Saint-Gobain Vitrage International (SGV), Ford Motor Company (Ford), General Motors Corporation (GM), Motor Vehicle Manufacturers Association of the United States, Incorporated (MVMA), Chrysler Motors Corporation (Chrysler), the Insurance Institute for Highway Safety (IIHS), Monsanto Chemical Company (Monsanto), Flachglas Aktiengesellschaft (Flachglas), Morton International (Morton), Libbey Owens Ford (LOF), and the Flat Glass Association of Japan (FGAJ). The following summarizes and addresses the comments.

A. Promulgation of Items 15A, 16A, and 16B Glass-Plastic Glazing

None of the commenters opposed the adoption of Item 15, annealed glass plastic glazing.

IIHS, however, had certain reservations about the use of Items 16A and 16B glazing, which NHTSA proposed to permit in all locations not requisite for driving visibility. That organization stated that "(i)f these glazing materials were restricted to areas that are, in fact, not requisite for driving visibility, this proposed change would merit adoption." IIHS expressed concern, however, that under the current NHTSA interpretations, areas to the rear of the driver in multipurpose passenger vehicles, trucks, and buses are not considered requisite for driving visibility. It stated that decreased visibility, such as that found in side and rear windows in multipurpose passenger vehicles, trucks, and buses, may result in safety hazards, including additional collisions during lane changes, backing out of driveways, and other maneuvers that require rearward vision. To support this assertion, it cited a study that it says suggests that inadequate rear visibility in multipurpose passenger vehicles and trucks may already be a factor in many pedestrian-vehicle collisions occurring in driveways and parking lots where children are present. IIHS opposed the adoption of Items 16A and 16B until visibility requirements for side and rear windows of multipurpose passenger vehicles, trucks, and buses are treated the same as passenger cars.

The agency notes that both Items 16A and 16B would be used in lieu of the currently approved Item 3 glazing that is allowed in areas in multipurpose passenger vehicles, trucks, and buses not currently considered requisite for driving visibility. There is no reason to believe that allowing these two glass-plastic alternatives to Item 3 glazing would adversely affect safety, since they have essentially the same character-

istics with respect to visibility. However, for some time, the agency has been aware of the discrepancy between visibility requirements for side and rear windows in passenger cars versus multipurpose passenger vehicles, trucks, and buses. The agency intends to address this discrepancy in a forthcoming rulemaking action.

Cautionary comments about glass-plastic glazing in general were made by LOF, GM, MVMA, and Chrysler. LOF recommended that testing be done on some of the new items of glazing as a result of this rulemaking to see if differences will be seen between acceptable and inferior automotive glazing. LOF stated that when it conducted impact tests of annealed side glass covered with a layer of polyester film, the samples produced what it believed were unacceptable jagged pieces of glass covered with plastic. The agency believes that the combination of tests in the ANS Z26 standard to be conducted on the new items of glazing assure that the tested materials would perform similarly to currently approved material. The agency states this because in developing performance specifications for Item 15, annealed glass-plastic, all the current tests for Item 2 glazing plus the applicable tests (Tests 17, 19, and 24) for the plastic side of Item 14 were adopted. In creating performance specifications for Item 16A, annealed glass-plastic, and 16B, tempered glass-plastic, the agency adopted performance tests for Item 3, laminated glazing plus the tests (Tests 19 and 24) from Item 14 that are applicable to the interior (plastic) side of the glazing.

GM, MVMA, and Chrysler supported the agency's desire to improve safety through encouraging greater use of glass-plastic glazing. These commenters expressed concerns, however, that improved abrasion resistance is needed before glass-plastic glazing can be successfully used in side window applications. GM noted that its experience with the "Inner-Shield" windshield indicated that glass-plastic glazing is susceptible to damage, even at a windshield location which would be expected to receive less abrasion or mistreatment than side windows. That company stated that mounting glass-plastic glazing in side windows would certainly increase the likelihood of abrasion problems as compared to the windshield, especially as a result of pets and small children. GM also stated that there is great potential for abrasion from moving side windows up and down, particularly after many cycles when dirt and debris have accumulated on the window and/or the weatherseal, and that side windows may become damaged as a result of cleaning.

NHTSA is concerned that the new items of glazing could become damaged as a result of severe use. Nevertheless, the agency believes that if these new types of glazing are permitted, manufacturers may be encouraged to find more durable materials for the plastic layer. Also, customers may come to understand the utility of the glazing, and learn how to care for it. The agency solicits any information or data that any party may obtain in the future concerning the durability of glass-plastic. The agency also intends to continue monitoring this aspect of glass-plastic glazing performance as this product is reintroduced in the market. If future information indicates that changes in requirements are necessary, the agency will take appropriate action.

Accordingly, this final rule adopts the three new items of glass-plastic glazing that were proposed in the NPRM.

B. Proposal for Item 15B, Tempered Glass-Plastic, in Locations Requisite for Driving Visibility Other than the Windshield

In the NPRM, the agency did not propose to create an item of tempered glass-plastic glazing in areas requisite for driving visibility other than the windshield because it was believed that when shattered, the dicing effect of tempered glass in glass-plastic glazing tends to obstruct vision, since the plastic layer tends to hold the diced pieces in place. This tends to adversely affect safety by limiting visibility when such glazing is used in windows that are requisite for driving visibility. The agency requested comments on this issue. The agency further requested information on methods of distinguishing tempered glass from annealed glass.

Although the commenters did not disagree that the dicing effect that occurs when tempered glass-plastic glazing is shattered would obscure vision, none of the commenters believed that concerns about such possible obscuration would outweigh benefits that would be had from glass-plastic glazing in the rear and side windows. Most of the commenters suggested the creation of an Item 15B, tempered glass-plastic glazing for areas requisite for driving visibility other than the windshield. SGV and Morton expressed the opinion that side breakage is most common during burglary attempts when the motor vehicle is parked, and that driving visibility is not an issue. Ford and GM expressed the opinion that some sideward transparency would still remain in a tempered glass-plastic window even after breakage.

Addressing other safety concerns, SGV stated that for tempered glass-plastic, the dicing effect of the broken glass is beneficial since it helps energy absorption. Only the exposed plastic around the cracks acts as an energy absorber. The plastic still bonded to the glass pieces does not absorb energy. Since, when shattered, tempered glass tends to result in more cracks than annealed glass, there would be less of the plastic that would be bonded to the glass pieces, and it would better help absorb energy than annealed glazing. This is significant since in the event of a head contact, a greater amount of plastic separating from the glass along the crack means more energy has been used in

separating the plastic from the glazing, and less energy would be available to be transferred to the head. SGV further stated that the plastic on tempered glass will not tear as readily as plastic does on annealed glass. This is apparently due to the longer continuous sharp glass edges on broken annealed glass.

Regarding other benefits to be had from tempered glass, Ford expressed the opinion that the extra protection against lacerations afforded by the dicing of tempered glass when broken and the greater strength of tempered glass which militates against its breakage in day-to-day use (due to door slamming, wind and hail damage, and vehicle road shocks) outweigh whatever impairment in the driver's sideward vision may be created when tempered glass-plastic glazing is broken. Both SGV and Morton emphasized that tempered glass is more appropriate than annealed glazing because it is stronger. Because annealed glass is more fragile than tempered glass, vehicle designers would be discouraged from using annealed glass-plastic, and would defer to traditional Item 2 monolithic tempered glass. Since annealed glass is weaker than tempered glass, the technical costs (of increased reinforcement) and warranty costs (for more frequent replacement) for annealed glass-plastic would be much higher.

The commenters argued that in crashes, tempered glass-plastic glazing would be safer than annealed glass plastic. As has been discussed above, the issue of visibility in the event of the tempered glass-plastic shattering was discussed in the rulemaking at issue. The discussion is bolstered by the public comments presented in another rulemaking to amend Standard No. 205. This rulemaking amended Test No. 26 of the ANS Z26 standard to specify clamping when Item 14 glass plastic-glazing is tested. (See 56 FR 12669; March 27, 1991.) In the NPRM for the Test No. 26 rulemaking (54 FR 41636, October 11, 1989), the agency proposed to amend Standard No. 205 to prohibit glass "that is strengthened by any method" from being used in "glass-plastic glazing in any windshield or other location requisite for driving visibility." (See 49 FR at 41641.) After reviewing the comments in the Test No. 26 rulemaking, the agency stated that it has reconsidered its former position that use of tempered glass in glass-plastic glazing could seriously compromise visibility through broken side and rear glass-plastic glazing. The agency now believes that the above described benefits that may be derived from use of tempered glass-plastic glazing outweigh concerns over its potential for more crashes as a result of lessened visibility through broken side and rear glazing.

Accordingly, in an SNPRM published in this issue of the *Federal Register*, the agency is proposing the creation of Item 15B, tempered glass-plastic glazing, for all locations that are requisite for driving visibility other than the windshield.

C. Deletion of Test No. 1 for Item 3 Glazing

Test No. 1, Light Stability, in the ANS Z26 standard, which has been incorporated by reference into Standard No. 205, is a measure of visual deterioration of the glazing due to exposure to sunlight and humidity. In the NPRM, the agency proposed deletion of this test for glazing that is used in areas that are not requisite for driving visibility, since it saw no safety need for this test requirement in such areas. The NPRM's discussion of the issue of deleting Test No. 1 was somewhat unclear. First, the wrong title was used for the test. Second, although the preamble discussed deletion of Test No. 1 for only Item 3 glazing, the wording in the proposed revision to the standard proposed deletion of the test for Item 3 and Item 9. However, based on the comments on this proposal, the agency believes its intent was understood by at least some of the commenters.

PPG, Flachglas, LOF, and FGAJ commented on this proposal. PPG and Flachglas concurred with the proposal to delete the test for Item 3 glazing but apparently did not note the wording to delete the test from Item 9. PPG stated that deleting this requirement was consistent with the previous deletion of the abrasion resistance requirements for both Item 3 and Item 9 materials. FGAJ pointed out that the NPRM had inaccurately referred to Test No. 1 as *Luminous Transmittance*. Luminous Transmittance is Test No. 2, and is not required for Items 3 and 9 glazing. Test No. 1 is actually called Light Stability, and as stated above, measures the luminous transmittance before and after the environmental tests.

LOF questioned the proposal to eliminate Test No. 1. It noted that the proposal appeared to presume that the test only monitors the light transmittance of the products. LOF stated that a change in light transmittance can also indicate interlayer deterioration. LOF warned that even though presently used polyvinyl butyral (PVB) undergoes very little, if any decomposition, elimination of this test for laminated or glass-plastic glazing may in the future allow plastics that have inferior weathering characteristics, and thus allow production of glazing products that may have long range safety and reliability problems.

The agency believes that the new issues raised by the commenters on the utility of Test No. 1 for Item 3 may have merit. The agency is also concerned that the discussion in the NPRM on this issue may not have been clear to some commenters. Therefore, in the SNPRM that appears in this issue of the *Federal Register*, the agency is providing another opportunity for public comment on this issue and is specifically asking for test data to document the type of safety problems that may arise by using plastics that would fail Test No. 1.

Test No. 7, Fracture (Fragment Size)

Currently, Fracture Test No. 7 measures the fragment size of tempered glass after it has been broken. Standard No. 205 currently allows fragments weighing up to 0.15 ounce and places no restrictions on the size or shape of the fragment. Having been advised by a truck trailer manufacturer in a 1986 meeting with NHTSA's Office of Enforcement that tempered glass could break into long, thin needles, the agency is concerned that these shapes could result in serious injury to vehicle occupants and others in the event of crashes. The agency stated its belief that glass that breaks into pieces larger than two inches may be poorly tempered, and that proper tempering will routinely produce glazing that breaks as intended in Standard No. 205. In the NPRM, the agency proposed to modify the test requirements to impose a maximum length of 2 inches on these fragments and a maximum length-to-width ratio of 3-to-1.

Most commenters expressed strong disagreement with the proposal. The main point of most of the comments was that the fact that the agency has received reports of unusual shapes of broken tempered glass does not mean that glass was improperly tempered. The unusual shapes may be due, they reported, to the forces involved in the breaking of the glass. Some commenters indicated that properly tempered glazing breaks in a variety of patterns, and in general, large deflections at the location of impact increase the probability of long, thin fragments. LOF stated that tempered glazing behaves differently in car accidents than under laboratory conditions because in accidents the glazing is subjected to severe mechanical stress and/or unusual break point locations that affect the size and shape of the glazing. It asserted that unusual pieces of broken tempered glazing from car accidents do not always indicate that the glass was not properly tempered. LOF also argued that the proposed rule of allowing a maximum length-to-width ratio of 3-1 without a lower size limit would eliminate all tempered automotive glazings, whether tempered or not. It stated that its preliminary testing of both laboratory samples and automotive parts indicates that all tempered glass, when broken, produces small pieces of glass that have a length-to-width ratio greater than 3-to-1.

Some commenters suggested several alternate tests to assess fragmentation. Chrysler suggested using the Economic Commission of Europe's (ECE) Regulation 43. PPG and Ford suggested using the test in the then-pending 1990 version of ANSZ26. LOF suggested the use of other criteria such as a variable maximum fragment size based on the thickness of the glazing. The agency has reviewed these alternatives.

The agency is not certain the ECE R43 Regulation prohibits narrow fragments any more than the current Standard No. 205 test does. To summarize, the ECE R43 Fragmentation Test uses a full-size specimen. The description of the mounting of the glass is rather vague. The impact points vary depending on the shape and type of glazing. The specimen is broken with either a hammer or an object with a similarly shaped point. After fracture, compliance with the test is determined by counting the number of fragments in a given area. ECE R43 states in part, that the test shall be deemed to have given a satisfactory result if "[t]he number of fragments in any 5 cm x 5 cm square is not less than 40 or more than 400, or in the case of glazing not more than 3.5 mm thick, 450." There also may be no fragments more than 7.5 cm (3 inches) long.

The agency is also not certain the 1990 version of ANS Z26 would do more to prohibit narrow fragments. Very briefly, the 1990 ANS Z26 contains a modified version of the 1980 version of the ANS Z26 Fracture test. This 1990 test has similarities to the ECE R43 test. Both the 1990 ANS Z26 and ECE R43 tests use a full-size specimen of glazing. A pointed object may be used to break the glass. The 1990 ANS Z26 has no further restriction on shape or size of the fragments than the 1980 version of ANS Z26.

The agency believes there may be problems with LOF's recommendation. LOF suggested a variable maximum weight based on the glass thickness. When the standard was established for a maximum weight of 0.15 ounces, the tempered glass then used was much thicker, approximately 0.250 inch thick. This is in contrast to tempered glass currently used which is about 0.125 inch thick. This reduction in thickness means that if LOF's recommendation were adopted, fragments of an increased length and width would be permitted, for the same weight.

Based on the commenters' assertion that even properly tempered glazing may not comply with the proposed test, and the absence of conclusive data to support or refute that assertion, the agency cannot conclude that the proposal would be practicable. The agency has therefore decided not to adopt the proposal to restrict length and length-to-width ratios of broken fragments in the final rule. However, the agency is still concerned about the need for a more effective fracture test. The agency will continue evaluating the issue and seeks at some point to propose an objective test procedure with a practicable means of compliance.

Clarification of the Definition of Gasoline Used in FMVSS 205 Testing

The chemical test in Standard No. 205 includes submersion in "gasoline," a term that is not defined. Therefore, in the NPRM the agency proposed adopting the definition of "gasoline" currently used in FMVSS No. 108, that is, American Society for Testing and Materials (ASTM) Reference Fuel C. Reference Fuel C

Fuel C consists of 50]ercent toluene and 50 percent isooctane. The composition is similar to typical 89 octane unleaded gasoline without the hazardous material, benzene.

The only comment on this issue was from Chrysler, which concurred with the proposal. Accordingly, the agency is adopting as final the definition of gasoline as ASTM Reference Fuel C for Standard No. 205.

Miscellaneous Issues Raised by Commenters

The following are additional issues raised by the commenters that have not been addressed in the previous sections. The agency has considered each of these issues and addresses them as follows:

In lieu of the numbering system for the new items of glazing proposed in the NPRM, Ford suggested a different system. It suggested that in addition to current Item 14 glass-plastic (for use anywhere in a vehicle), the agency add Items 14a (tempered glass plastic for use in areas requisite for driving visibility), 14b (proposed Item 15), 14c (proposed Item 16A), and 14d (proposed Item 16B). Ford suggested that it would add to clarity to group all these categories of glass-plastic together.

The agency believes the basic issue in numbering is what system would be least confusing. Numbering is important for importation, and for law enforcement purposes by Federal, state, and local governments. To this end, there has been extensive experience with the current numbering system for glazing, that is, numbering the items by where they are located in the vehicles, not by the type of glazing. The agency proposed separate numbers, such as 15 and 16, in the belief that they would be less confusing than a single number distinguished by an alphabetical suffix indicating the location in vehicles in which an item of glazing may be used. The agency's proposal is consistent with the current numbering practice in which new items of glazing are assigned specific numbers. The numbers that have been assigned to the items of glass-plastic glazing, numbers 14, 15A, 16A, and 16B, correspond to the order of the items of conventional glazing, Items 1, 2, and 3, in that the item of glazing that may be used anywhere in a motor vehicle including the windshield appears first, followed by the glazing that may be used in areas requisite for driving visibility, except the windshield, and last, the glazing that may be used only in areas not requisite for driving visibility. Since in the case of both conventional glazing and glass-plastic glazing, identifier numbers are used, and locations specified for the glazing appear in the same order, the existing system makes it easier to remember where the new items of glass-plastic glazing may be used. For these reasons the agency does not agree that Ford's numbering system would add to clarity, and the agency has decided not to adopt Ford's suggestion.

The FGAJ suggested deletion of the Boil Test, Test No. 4, from all the proposed categories of glass-plastic. It also requested deleting Test No. 4 from the list of tests currently required for Item 14. It proposed that Test No. 4 be replaced by the Bake Test, Test No. 5. The Bake Test is used in ANS Z26 for testing whether "multiple glazing units" will withstand tropical temperatures over an extended period of time. A multiple glazing unit has two or more sheets of glazing separated by an air space. The test is conducted at 212 degrees Fahrenheit, the same temperature as the Boil Test.

The main difference between the two tests is the presence of humidity or water in the Boil Test which is absent in the Bake Test. The agency is aware from field reports and certification test failures from independent laboratories that some grades of plastic will become opaque in the presence of moisture. If not detected, this could be a hazardous situation in humid, hot climates. Accordingly, the agency believes that it is inappropriate to replace the Boil Test with the Bake Test.

G. Technical Amendments

In the NPRM, the agency stated its intent to make certain tests for Item 14 glass-plastic glazing applicable to the three new items of glass-plastic glazing. The NPRM did not explicitly state that changes to Tests 17 (Abrasion resistance (plastics)), 19 (Chemical resistance), and 28 (Temperature change), made when Item 14 was promulgated, to make the tests more appropriate for glass-plastic glazing, would also apply to the three new items of glass-plastic glazing. The NPRM also did not explicitly state that Item 15 is prohibited in convertible-type vehicles, as is Item 14, to prevent excessive deterioration of glazing in areas requisite for driving visibility due to ultraviolet radiation. The final rule makes explicit the agency's intent in these areas.

Effective Date

This rule relieves a restriction in Standard No. 205, by facilitating the use of glass-plastic glazing at all glazing locations in motor vehicles. It permits those manufacturers that wish to increase the use of glass-plastic glazing in their vehicles and that are able to do so to use more glass-plastic glazing. On the other hand, those manufacturers that cannot increase the use of glass-plastic glazing at this time or that do not wish to do so will not be required to use glass-plastic glazing. Because this rule permits, but does not require, the increased use of glass-plastic glazing, the agency has concluded that this option should be in place sooner than 180 days after the issuance of this rule. Therefore, the agency finds for good cause that this rule should become effective 30 days after it is published.

2. S5.1.1.1(d) of Standard No. 205 is revised to read as follows:

* * * * * *

(d) Gasoline, ASTM Reference Fuel C, which is composed of Isooctane 50 volume percentage and Toluene 50 volume percentage. Isooctane must conform to A2.7 in Annex 2 of the Motor Fuels Section of the *1985 Annual Book of ASTM Standards.* Vol. 05.04, and Toluene must conform to ASTM specification D362-84, *Standard Specification for Industrial Grade Toluene.* ASTM Reference Fuel C must be used as specified in:

(1) Paragraph A2.3.2 and A2.3.3 of Annex 2 of Motor Fuels, Section 1 in the *1985 Annual Book of ASTM Standards*;

(2) OSHA Standard 29 CFR 1910.106—"Handling Storage and Use of Flammable Combustible Liquids."

* * * * * *

3. S5.1.2.4 and S5.1.2.5 are removed and new S5.1.2.4 through S5.1.2.10 are added to Standard No. 205, to read as follows:

* * * * * *

S5.1.2.4 *Item 14—Glass-Plastics.* Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.10 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used anywhere in a motor vehicle, except that it may not be used in convertibles, in vehicles that have no roof, or in vehicles whose roofs are completely removable.

S5.1.2 5 *Item 15A—Annealed Glass-Plastic For Use In All Positions In a Vehicle Except The Windshield.* Glass-plastic glazing materials that comply with Test Nos. 1, 2, 3, 4, 9, 12, 16, 17, 18, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used anywhere in a motor vehicle except the windshield, and may not be used in convertibles, in vehicles that have no roof, or in vehicles with roofs that are completely removable.

S5.1.2.6 [Reserved]

S5.1.2.7 *Item 16A—Annealed Glass-Plastic for Use in all Positions in a Vehicle Not Requisite for Driving Visibility.* Glass-plastic glazing materials that comply with Test Nos. 3, 4, 9, 12, 16, 19, 24, and 28, as those tests are modified in S.1.2.9 *Test Procedures for Glass-Plastics,* may be used in a motor vehicle in all locations not requisite for driving visibility.

S5.1.2.8 *Item 16B—Tempered Glass-Plastic For Use in all Positions in a Vehicle Not Requisite for Driving Visibility.* Glass-plastic glazing materials that comply with Test Nos. 3, 4, 6, 7, 8, 16, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used in a motor vehicle in all locations not requisite for driving visibility.

S5.1.2.9 *Test Procedures for Glass-Plastics.* (a) Test Nos. 6, 7, 8, 9, 12, 16, and 18 shall be conducted on the glass side of the specimen, i.e, the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10 percent or less than 5 percent by weight and ammonium hydroxide no greater than 5 percent or less than 1 percent by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of $-40°C$ ($\pm 5°C$), which is equivalent to $-40°F$ ($\pm 9°F$), for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

S5.1.2.10 *Cleaning instructions.* (a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.7, or S5.1.2.8 shall affix a label, removable by hand without tools, to each item of such glazing material. The label shall identify the product involved, specify instructions and agents for cleaning the material that will minimize the loss of transparency, and instructions for removing frost and ice, and, at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manufacturer of glazing materials designed to meet the requirements of paragraphs S5.1.2.4, S5.1.2.5, S5.1.2.7, or S5.1.2.8 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 high, the following words,

GLASS PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS.

* * * * * *

4. S6.1 of Standard No. 205 is revised to read as follows:

* * * * * *

S6.1 Each prime glazing material manufacturer, except as specified below, shall mark the glazing materials it manufactures in accordance with section 6 of ANS Z26. The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.7, and S5.1.2.8 shall be identified by the marks "AS 11C," "AS 12," "AS 13," "AS 14," "AS 15A," "AS 16A," and "AS 16B,", respectively. A prime glazing material manufacturer is one who fabricates, laminates, or tempers the glazing material.

Jerry Ralph Curry
Administrator

56 F.R 18526
April 23, 1991

MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

S1. Scope. This standard specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment.

S2. Purpose. The purpose of this standard is to reduce injuries resulting from impact to glazing surfaces, to ensure a necessary degree of transparency in motor vehicle windows for driver visibility, and to minimize the possibility of occupants being thrown through the vehicle windows in collisions.

S3. Application. This standard applies to glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses, motorcycles, slide-in campers, and pickup covers designed to carry persons while in motion.

S4. Definitions.

Bullet resistant shield means a shield or barrier that is installed completely inside a motor vehicle behind and separate from glazing materials that independently comply with the requirements of this standard.

Camper means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

Motorhome means a multipurpose passenger vehicle that provides living accommodations for persons.

Pickup cover means a camper having a roof and sides but without a floor, designed to be mounted on and removable from the cargo area of a truck by the user.

Slide-in camper means a camper having a roof, floor, and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

Glass-plastic glazing material means a laminate of one or more layers of glass and one or more layers of plastic in which a plastic surface of the glazing faces inward when the glazing is installed in a vehicle.

S5. Requirements.

S5.1 Materials.

S5.1.1 Glazing materials for use in motor vehicles, except as otherwise provided in this standard, shall conform to the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z-26.1-1977, January 26, 1977, as supplemented by Z26.1a, July 3, 1980 (hereinafter referred to as "ANS Z26"). However, Item 11B glazing as specified in that standard may not be used in motor vehicles at levels requisite for driving visibility, and Item 11B glazing is not required to pass Test Nos. 17, 30, and 31.

S5.1.1.1 The chemicals specified for testing chemical resistance in Tests Nos. 19 and 20 of ANS Z26 shall be:

(a) One percent solution of nonabrasive soap.

(b) Kerosene.

(c) Undiluted denatured alcohol, Formula SD No. 30 (1 part 100-percent methyl alcohol in 10 parts 190-proof ethyl alcohol by volume).

(d) [Gasoline, ASTM Reference Fuel C, which is composed of Isooctane 50 volume percentage and Toluene 50 volume percentage. Isooctane must conform to A2.7 in Annex 2 of the Motor Fuels Section of the *1985 Annual Book of ASTM Standards.* Vol. 05.04 and Toluene must conform to ASTM specification D362-84, *Standard Specification for Industrial Grade Toluene.* ASTM Reference Fuel C must be used as specified in:

(1) Paragraph A2.3.2 and A2.3.3 of Annex 2 of Motor Fuels, Section 1 in the *1985 Annual Book of ASTM Standards;*

(2) OSHA Standard 29 CFR 1910.106—"Handling Storage and Use of Flammable Combustible

Liquids." **(56 F.R. 18526—April 23, 1991. Effective: May 23, 1991)**

S5.1.1.2 The following locations are added to the lists specified in ANS Z26 in which item 4, item 5, item 8 and item 9 safety glazing may be used:

(a)-(i) **[Reserved]**

(j) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(k) Windows and doors in slide-in campers and pickup covers.

(l) Windows and doors in buses except for the windshield, windows to the immediate right or left of the driver, and rearmost windows if used for driving visibility.

(m) For Item 5 safety glazing only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

S5.1.1.3 The following locations are added to the lists specified in ANS Z26 in which item 6 and item 7 safety glazing may be used:

(a)-(i) **[Reserved]**

(j) Windows and doors in motorhomes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

(k) Windows, except forward-facing windows, and doors in slide-in campers and pickup covers.

(l) For item 7 safety glazing only:

(1) Standee windows in buses.

(2) Interior partitions.

(3) Openings in the roof.

S5.1.1.4 The following locations are added to the lists specified in ANS Z26 in which item 8 and item 9 safety glazing may be used:

(a)-(e) **[Reserved)]**

(f) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(g) Windows and doors in slide-in campers and pickup covers.

S5.1.1.5 The phrase "readily removable" window as defined in ANS Z26, for the purposes of this standard, in buses having a GVWR of more than 10,000 pounds, shall include pushout windows and windows mounted in emergency exits that can be manually pushed out of their location in the vehicle without the use of tools, regardless of whether such windows remain hinged at one side to the vehicle.

S5.1.1.6 Multipurpose passenger vehicles. Except as otherwise specifically provided by this standard, glazing for use in multipurpose passenger vehicles shall conform to the requirements for glazing for use in trucks as specified in ANS Z26.

S5.1.1.7 Test No. 17 is deleted from the list of tests specified in ANS Z26 for item 5 glazing material and Test No. 18 is deleted from the lists of tests specified in ANS Z26 for item 3 and item 9 glazing material.

S5.1.2 In addition to the glazing materials specified in ANS Z26, materials conforming to S5.1.2.1, S5.1.2.2, S5.1.2.3 or S5.1.2.4 may be used in the locations of motor vehicles specified in those sections.

S5.1.2.1 Item 11C—Safety Glazing Material for Use in Bullet Resistant Shields. Bullet resistant glazing that complies with Test Nos. 2, 17, 19, 20, 21, 24, 27, 28, 29, 30 and 32 of ANS Z26 and the labeling requirements of S5.1.2.5 may be used only in bullet resistant shields that can be removed from the motor vehicle easily for cleaning and maintenance. A bullet resistant shield may be used in areas requisite for driving visibility only if the combined parallel luminous transmittance with perpendicular incidence through both the shield and the permanent vehicle glazing is at least 60 percent.

S5.1.2.2 Item 12—Rigid plastics. Safety plastics materials that comply with Test Nos. 10, 13, 16, 19, 20, 21 and 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5, may be used in a motor vehicle only in the following specified locations at levels not requisite for driving visibility.

(a) Windows and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield and windows to the immediate right or left of the driver.

(h) Windows and doors in buses except for the windshield and window to the immediate right and left of the driver.

S5.1.2.3 Item 13—Flexible plastics. Safety plastic materials that comply with Tests Nos. 16, 19, 20, 22, and 23 or 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5 may be used in the following specific locations at levels not requisite for driving visibility.

(a) Windows, except forward-facing windows, and doors in slide-in campers and pick-up covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

S5.1.2.4. [Item 14—Glass-Plastics. Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.10 and Tests Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used anywhere in a motor vehicle, except that it may not be used in convertibles, in vehicles that have no roof or in vehicles whose roofs are completely removable.

S5.1.2.5 *Item 15A—Annealed Glass-Plastic For Use In All Positions In a Vehicle Except The Windshield.* Glass-plastic glazing materials that comply with Test Nos. 1, 2, 3, 4, 9, 12, 16, 17, 18, 19, 24, and 28 as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used anywhere in a motor vehicle except the windshield, and may not be used in convertibles, in vehicles that have no roof, or in vehicles with roofs that are not completely removable. **(56 F.R. 18526—April 23, 1991. Effective: May 23, 1991)]**

[S5.1.2.6 [Reserved]

[S5.1.2.7 *Item 16A—Annealed Glass-Plastic For Use In All Positions In a Vehicle Not Requisite For Driving Visibility.* Glass-plastic glazing materials that comply with Test Nos. 3, 4, 9, 12, 16, 19, 24, and 28, as those test are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used in a motor vehicle in all locations not requisite for driving visibility.

[S5.1.2.8 *Item 16B—Tempered Glass-Plastic For Use In All Positions In A Vehicle Not Requisite For Driving Visibility.* Glass-plastic glazing materials that comply with Test Nos. 3, 4, 6, 7, 8, 16, 19, 24, and 28, as those tests are modified in S5.1.2.9 *Test Procedures for Glass-Plastics,* may be used in a motor vehicle in all locations not requisite for driving visibility.

[S5.1.2.9 *Test Procedures for Glass-Plastics.* (a) Tests Nos. 6, 7, 8, 9, 12, 16, and 18 shall be conducted on the glass side of the specimen, i.e., the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10% or less than 5% by weight and ammonium hydroxide no greater than 5% or less than 1% by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of −40°C (±5°C), which is equivalent to −40°F (±9°F), for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

[**S5.1.2.10** Cleaning instructions. (a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.7, or S5.1.2.8 shall affix a label, removable by hand without tools, to each item of such glazing material. The label shall identify the product involved, specify instructions and agents for cleaning the material that will minimize the loss of transparency, and instructions for removing frost and ice, and, at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manufacturer of glazing materials designed to meet the requirements of paragraphs S5.1.2.4, S5.1.2.5, S5.1.2.7, or S5.1.2.8 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than $^3/_{16}$ inch nor more than ¼ high, the following words, "GLASS PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS." **(56 F.R. 18526—April 23, 1991. Effective: May 23, 1991)**]

S5.2 Edges. In vehicles except school buses, exposed edges shall be treated in accordance with SAE Recommended Practice J673a, "Automotive Glazing," August 1967. In school buses, exposed edges shall be banded.

S6. Certification and marking.

S6.1 [Each prime glazing material manufacturer, except as specified below, shall mark the glazing materials it manufacturers in accordance with section 6 of ANS Z26. The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, S5.1.2.4, S5.1.2.5, S5.1.2.7, and S5.1.2.8 shall be identified by the marks "AS 11C", "AS 12", "AS 13", "AS 14", "AS 15A", "AS 16A", and "AS 16B", respectively. A prime glazing material manufacturer is one who fabricates, laminates, or tempers the glazing material. **(56 F.R. 18526—April 23, 1991. Effective: May 23, 1991)**]

S6.2 Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed as a component of any specific motor vehicle or camper, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act of 1966, by adding to the mark required by S6.1 in letters and numerals of the size specified in section 6 of ANS Z26, the symbol "DOT" and a manufacturer's code mark, which will be assigned by the NHTSA on the written request of the manufacturer.

S6.3 Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed to be cut into components for use in motor vehicles or items of motor vehicle equipment, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act.

S6.4 Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall mark that material in accordance with section 6 of ANS Z26.

S6.5 Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall certify that his product complies with this standard in accordance with section 114 of the National Traffic and Motor Vehicle Safety Act.

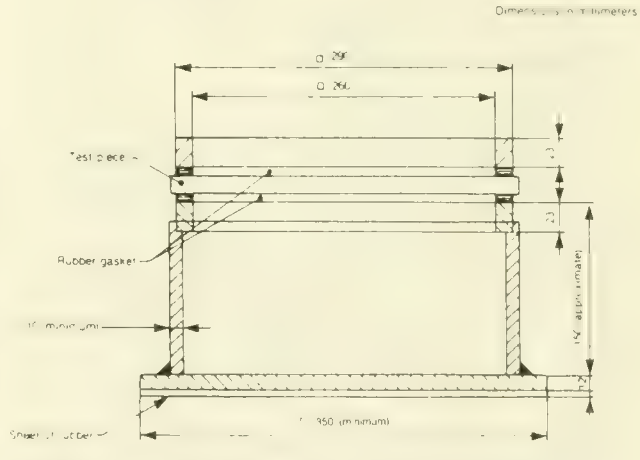


Figure 1—Test Fixture for Clamped Specimens

37 F.R. 12237
June 21, 1972

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 210

Seat Belt Assembly Anchorages
(Docket No. 87-02; Notice 2)
RIN 2127-AA95

ACTION: Final rule.

SUMMARY: This rule makes several amendments to the safety standard regulating seat belt assembly anchorages. Specifically, this rule:

1. Increases the minimum lap belt angle to reduce the likelihood of occupant submarining in a crash (i.e., the occupant sliding forward and under the safety belt in a crash);
2. Exempts front outboard designated seating positions equipped with automatic safety belts or dynamically tested manual safety belts from the requirement that those positions also be equipped with anchorages for manual lap/shoulder belts. This exemption will remove an unnecessary and redundant regulatory requirement without reducing occupant safety;
3. Permits the optional use of some new test equipment for compliance testing to make the compliance tests simpler and less costly to perform; and
4. Clarifies some ambiguities in the current compliance testing procedures so that all parties will know precisely how compliance testing will be conducted by the agency.

EFFECTIVE DATES: The amendments made in this rule are effective as of September 1, 1992, except for the amendment to S4.1.3, which takes effect April 30, 1990.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR §571.210) sets forth performance requirements for safety belt anchorages to ensure their proper location for effective occupant protection and to reduce the likelihood of the anchorage's failure in a crash. The requirements of the standard that applies to passenger cars, trucks, buses, and multipurpose passenger vehicles establish zones within the vehicle where an anchorage must be located and the forces that an anchorage must be capable of withstanding during a static strength test.

BL Technology, Ltd., General Motors, and Mercedes-Benz each petitioned the agency to amend different aspects of Standard No. 210. Additionally, NHTSA's experience conducting its compliance testing under Standard No. 210 indicated a need to modify or clarify some aspects of the standard. Accordingly, the agency published a notice of proposed rulemaking (NPRM) on February 3, 1987 (52 FR 3293).

NHTSA received 28 comments in response to this NPRM. All of these comments were considered while formulating this final rule, and the most significant comments are addressed below. This preamble uses the same organization as the NPRM's preamble, to aid the reader in comparing the two documents.

I. *Anchorage Strength Test Procedures*

Standard No. 210 uses a laboratory test instead of a crash test to measure the strength of safety belt anchorages. In a laboratory, or "static" test, forces are slowly applied to the anchorages for a period of up to 30 seconds. In a crash, or "dynamic" test, forces are quickly applied and last for less than a second. Standard No. 210 currently specifies the minimum loads that the anchorage must withstand in a laboratory test, the maximum rate of increase in applying that load to the anchorage, and a minimum period of ten seconds during which the anchorage must withstand the specified load.

BL Technology, Ltd. (BL) filed a petition asking the agency to amend Standard No. 210 to harmonize the anchorage strength test procedure with the Economic Commission for Europe (ECE) Regulation No. 14 on safety belt anchorages. The ECE regulation uses a non-crash static or quasi-dynamic test procedure to evaluate the strength of the anchorage. Although the ECE regulation requires anchorages to be subjected to virtually the identical load as does Standard No. 210, the ECE regulation specifies a load application rate of "as fast as possible" for the anchorages and a much shorter period during which the anchorage must withstand the load. BL argued that adopting the ECE test procedure would reduce vehicle weight and cost. More specifically, BL said that additional welds and reinforcing brackets are

necessary on a vehicle to allow its anchorages to withstand the 10-second load duration of Standard No. 210, but such structural reinforcement is not required to meet the 0.2-second load duration of ECE Regulation No. 14. BL also argued that the static test procedure of Standard No. 210 is not representative of real world crash conditions.

In response to this petition, the agency acknowledged in the NPRM that the static test procedure of Standard No. 210 imposes a load for a longer period of time on an anchorage than is imposed in a real crash or a crash test. The agency also acknowledged in the NPRM that metal structures can withstand greater forces under dynamic loading than under static loading. This means that an anchorage that fails at a given force level under the static loading conditions of Standard No. 210 would not necessarily fail if exposed to that same force level under dynamic loading conditions. To this extent, then, NHTSA agrees with BL's assertion that Standard No. 210's test procedure is not representative of actual crashes.

However, NHTSA was concerned that a potential reduction in safety could result from adopting BL's request to harmonize Standard No. 210's anchorage requirements with those of ECE Regulation No. 14. Because metals can withstand larger force levels under dynamic loading than under static loading, a decision to retain the same force levels but shift from static loading to dynamic loading would allow the use of metals of lesser strength for the anchorage. However, this possibility could be avoided if such a decision were accompanied by a decision to increase the ultimate test load and anchorage is required to withstand or to require the safety belt/anchorage system to meet other occupant crash protection requirements. To more fully explore this topic, the NPRM solicited comments on three possible changes to the anchorage strength requirements. The agency stated in the NPRM that, based on its evaluation of the comments received on the NPRM and on its continuing assessment of test data from the New Car Assessment Program (NCAP) and other crash tests, NHTSA would determine whether changes in the anchorage test procedures or anchorage load requirements were appropriate or necessary.

A. *Exclusion of Anchorages for Dynamically Tested Manual Belt Assemblies from the Strength Requirements*

In comments on other rulemaking actions addressing the dynamic testing of manual belt assemblies, a number of vehicle manufacturers had requested that the anchorages for dynamically tested manual safety belt assemblies be excluded from the strength requirements of Standard No. 210. These manufacturers argued that requiring a safety belt system to meet the injury criteria of Standard No. 208 measured on test dummies in a crash test is sufficient assurance that vehicle occupants will be adequately protected in a real-world crash. In the NPRM, NHTSA sought comments on whether this argument was persuasive, or whether the strength requirements ought to be retained to assure adequate protection for occupants larger than the 50th percentile adult male (the size of the test dummy used in crash testing) or to assure adequate protection after the anchorage is exposed to corrosion or other forms of potential anchorage weakening over the vehicle's life.

In response to this request for comments, nine commenters (Volvo, Austin, Chrysler, Ford, GM, Fiat, Toyota, Mazda, and the Motor Vehicle Manufacturers Association) stated that anchorages for dynamically tested belt assemblies should be excluded from Standard No. 210's strength requirements. Mercedes-Benz commented that anchorages for dynamically tested belt assemblies should *not* be excluded from Standard No. 210's strength requirements. According to this comment, the strength requirements for anchorages of dynamically tested safety belt assemblies help assure effective protection for occupants in crashes with impact speeds greater than 30 mph and occupants whose properties exceed those of the 50th percentile adult male.

After reconsidering this issue, the agency has decided to maintain the current requirement that the anchorages for dynamically tested safety belts are subject to the anchorage strength requirements of Standard No. 210. First, NHTSA believes that the strength requirements help assure that the safety belt assembly and anchorage will afford effective protection under conditions more severe than those for dynamic testing (i.e., occupants larger than 50th percentile adult male, crash speed greater than 30 mph, etc.). Mercedes concurred with this judgment in its comments. On the other hand, none of the commenters that supported an exclusion from the strength requirements for dynamically tested manual belts addressed the need for occupant protection under conditions more severe than those encountered in the dynamic testing.

Second, the agency believes that the requirements for dynamically tested manual and automatic safety belts should be consistent, at least insofar as the dynamic testing common to both types of safety belts is the basis for the requirement. NHTSA has expressly and consistently stated for more than 10 years that anchorages for automatic safety belts are *not* excluded from the strength requirements of Standard No. 210. *See* the agency's July 26, 1978 interpretation letter to Mr. Toko Iinuma and the July 23, 1980 letter to Mr. M. Ogata. Since the agency has not found the dynamic testing of auto-

matic belts to be a sufficient justification for excluding automatic belt anchorages from the strength requirements of Standard No. 210, it would be inconsistent for the agency to now conclude that the same dynamic testing *is* a sufficient justification for excluding the anchorages for manual safety belts from the strength requirements of Standard No. 210.

Third, the agency continues to believe that a margin of safety in anchorage strength is a reasonable surrogate for corrosion or other forms of potential anchorage weakening that might be encountered over a vehicle's life. General Motors (GM) took issue with this hypothesis in its comments, stating that "the likelihood of a correlation between the results of Standard No. 210 anchorage strength testing and the potential for anchorage weakening is remote." However, GM conceded that it had no data to refute this position. NHTSA did not intend to suggest that anchorages that were stronger when new would be less likely to weaken while in service. However, NHTSA is unaware of, and no commenter tried to offer, any reason why an anchorage with a higher nominal strength than another anchorage when new would not retain a relative strength advantage over the weaker anchorage when both are degraded by factors, such as stress or corrosion, to which anchorages may be exposed while a vehicle is in service.

B. *Harmonization with ECE*

The NPRM requested comments on revising the strength test of Standard No. 210 to be similar to the requirements of ECE Regulation No. 14. Both Regulation No. 14, and the newer ECE Regulation 14.02, specify anchorage strength requirements, and require an anchorage to be subjected to a load nearly identical to that currently specified in Standard No. 210 (3,035 pounds for shoulder belt in ECE vs. 3,000 pounds in Standard No. 210, and 5,002 pounds for lap belt in ECE vs. 5,000 pounds in Standard No. 210). However, the ECE regulations specify that the load be held for 0.2 seconds, as opposed to the 10 second load hold currently specified by Standard No. 210, and that the load be applied "as rapidly as possible," as opposed to the provisions in Standard No. 210 that the load be attained in as little time as possible but in not more than 30 seconds. Since the ECE requirement that the load be applied "as rapidly as possible" would not satisfy the requirement in the National Traffic and Motor Vehicle Safety Act that each safety standard "be stated in objective terms," NHTSA requested comments on retaining the maximum force onset rates currently specified in Standard No. 210 (50,000 pounds per second for lap belts and 30,000 pounds per second for lap/shoulder belts), and that the specified force levels be attained in not more than 5 seconds, compared with the 30 seconds currently specified in Standard No. 210.

Many commenters supported these proposed changes, arguing that these periods for attaining and holding the required loads would be more representative of real world crash situations. Additionally, some of those commenters stated that they have never seen a single anchorage failure on vehicles with anchorages certified to the ECE requirements. While nearly all commenters agreed with the proposal to shorten the time for which the load must be held by the anchorage to 0.2 seconds, Ford, GM, and Jaguar suggested that the 5-second period proposed for attaining the specified load be further shortened. Ford commented that the proposed 5-second period in which to attain the load should be shortened to harmonize with the ECE "as rapidly as possible" requirement. GM commented that the 5-second period in which to attain the specified load would be unrepresentative of loading in crashes, and stated that it appears to be practicable with newer testing equipment to attain the specified load in 1.0 second. Jaguar commented that some newer test equipment can apply the specified load in less than 0.3 seconds, and suggested that the rule should be amended to require the specified loading to be attained in not more than 0.3 seconds. Mitsubishi, on the other hand, supported the proposal to lower to 0.2 seconds the time the anchorage must hold the specified load, but objected to the proposal that the specified loading be attained in 5 seconds. According to this commenter, the proposal to require the specified load to be attained in 5 seconds would necessitate either extensive modifications of existing testing equipment or the purchase and installation of new testing equipment.

NHTSA has carefully reconsidered this subject after reviewing these comments. Safety requirements can evaluate the performance of safety equipment by following two general approaches. These approaches are as follows:

1. The safety requirements can evaluate performance by providing for test conditions that simulate actual crash conditions. The advantage of this approach is that it permits an evaluation of the occupant protection capabilities of all the systems in a vehicle in a single test. To the extent that those systems work synergistically, that synergism will be reflected in the test. Examples of safety standards that use test conditions that simulate an actual vehicle crash are Standard No. 208, *Occupant Crash Protection*, and Standard No. 301, *Fuel System Integrity*. It is obviously imperative that test conditions in these and other safety standards intended to simulate crash conditions actually do so.

2. Alternatively, however, safety requirements can evaluate the performance of vehicle safety equip-

ment by providing for test conditions that are structured to ensure that the safety equipment will perform adequately in actual crash conditions *without* simulating those conditions. Test conditions that do *not* simulate actual crash conditions are developed generally where it would be infeasible or too costly to design and/or implement any single test procedure or series of test procedures that reasonably simulate the conditions to which the safety equipment will be exposed, including possible crash conditions and possible degradation over time because of exposure to environmental factors. Examples of safety standards that use test conditions *not* intended to simulate an actual vehicle crash are Standard No. 209, *Seat Belt Assemblies*, and Standard No. 210, *Seat Belt Assembly Anchorages*.

The test conditions specified in this latter type of safety requirement are intended to subject the vehicle safety equipment to force or exposure levels that are sufficiently high so that one can reasonably conclude that the equipment is unlikely to fail as a result of exposure to even severe crash conditions or environmental exposures. Such test conditions are necessarily more severe than typical crash conditions, to ensure a margin of safety in the standard. That is, even if the test conditions were not directly representative of actual crash conditions, the test conditions are so demanding that one can confidently predict that equipment that withstands the test conditions will withstand most crash conditions, even severe crash conditions.

Hence, it is *not* a telling point to assert that the loading conditions for the anchorage strength test in Standard No. 210 do not simulate actual crashes. These test conditions admittedly do not simulate actual crashes, nor are they intended to do so.

Neither the current Standard No. 210 anchorage strength test procedures nor the ECE Regulation No. 14 anchorage strength test procedures is a close simulation of actual crash conditions. From sled tests, NHTSA has observed that total loading time for safety belts (including the onset of loading, holding the maximum load, and the release of the loading) ranges from about 0.10 to 0.15 seconds. The observed durations for holding the maximum load were generally less than 0.005 seconds. These time periods should be compared with the 30 second period permitted to attain the load and the 10 second period for holding the maximum load specified in Standard No. 210, and the provisions in the ECE regulation for attaining the load and holding the load for 0.2 seconds.

Both the load onset (up to 30 seconds) and the load holding times (10 seconds) currently specified in Standard No. 210 are admittedly orders of magnitude greater than the corresponding time periods observed in crashes (not more than 0.15 seconds and less than 0.005 seconds, respectively). However, the load onset ("as rapidly as possible," which was said by a commenter to be as little as 0.3 seconds) and load holding (0.2 seconds) times needed for testing for compliance with the ECE regulation are also substantially greater than the corresponding periods observed in crashes. Thus, neither the anchorage strength test in Standard No. 210 nor the anchorage strength test in the ECE regulation is an accurate simulation of actual crash conditions. Instead, both of these anchorage strength tests represent test conditions intended to be sufficiently demanding to ensure that the anchorage will not fail even under the most severe crash conditions.

As noted in the NPRM and by many of the commenters, the anchorage strength test in the ECE regulation is less stringent than the anchorage strength test in Standard No. 210. Adopting the ECE regulation could allow some slight reduction in vehicle weight and costs for the manufacturer by permitting the manufacturer to omit the additional welds and reinforcing brackets that BL's petition stated are necessary to comply with Standard No. 210, but unnecessary to comply with the ECE regulation. Conversely, the agency has no way of confirming with a reasonable degree of confidence that there have been no anchorage failures in actual crashes of vehicles certified as complying with the ECE regulation. Thus, the "margin of safety" provided by the ECE regulation can neither be confirmed nor denied.

In addition, NHTSA continues to observe shoulder belt loads in its New Car Assessment Program (NCAP) tests in excess of the 3,000-pound load to which the shoulder belts are subjected in Standard No. 210 compliance testing. The significance of this is that anchorages will be exposed to higher force levels in some real world crashes than in the compliance testing. To help compensate for this, the compliance testing may either be revised to specify higher force levels or the compliance testing may specify that anchorages shall be subjected to its loads for a longer duration. Standard No. 210's anchorage strength test currently uses this latter approach.

In its comments, Mercedes stated that it had not seen belt loads as high as those recorded in the agency's NCAP test data. Mercedes hypothesized that the technique used for measuring the belt loads in NCAP tests may produce spurious data. To investigate whether such potential error existed in the NCAP test data, NHTSA retrieved and analyzed the digitized shoulder belt transducer signals from three different automobiles in which shoulder belt loads in excess of 3,000 pounds were recorded. These three cars were a 1981 Toyota Cressida, a 1984 Ford Mustang, and a 1986 Oldsmobile Toronado. The shoulder belt loads recorded for the driver and

passenger shoulder belts were plotted as a function of force versus time. If the shoulder belt loads were the result of spurious signals being recorded, that would be expected to show up as inconsistencies between the graphs plotted for the passenger and driver positions in the same vehicle. However, no such inconsistencies were shown on these data graphs. Therefore, the agency has no evidence to support Mercedes' hypothesis that the NCAP data are unreliable. To the contrary, NHTSA's reexamination of the NCAP data leads to the conclusions that the data on belt loads in 35 mile per hour crash tests with 50th percentile male dummies are properly measured and recorded, and that some of the belt loads observed in those tests exceed the 3,000 pound forces to which lap/shoulder belt anchorages are subjected during the compliance testing for Standard No. 210.

NHTSA has decided not to reduce the "margin of safety" currently required for anchorage strength, even to the ECE level. The current anchorage strength test effectively requires vehicle manufacturers to use additional reinforcements at the anchorage points, as compared with what is needed to satisfy the anchorage strength test in the ECE regulation. There is no question that these additional reinforcements are feasible and practicable, since manufacturers have been doing so for more than 20 years. The agency has considered whether the costs and other burdens associated with these reinforcements are excessive in relation to the benefits resulting from these reinforcements. NHTSA estimates that the additional reinforcement typically adds about 4 to 8 ounces of steel at a cost of approximately one dollar per vehicle. Although NHTSA cannot quantify the safety benefits or the actual margin of safety attributable to the additional reinforcements, the agency believes it would be inappropriate to *potentially* reduce the safety protection afforded to vehicle occupants to achieve such minimal cost savings. Thus, this rule does not make any change to the load onset or load holding times for the anchorage strength test in Standard No. 210.

1. *Harmonization of Lap Belt Mounting Angles*

Standard No. 210 currently includes a minimum and maximum mounting angle for lap-only safety belts and for the lap belt portion of lap/shoulder belts. The minimum mounting angle requirement reduces the possibility of occupant submarining. Occupant submarining occurs when an occupant slides forward and under the safety belt during a crash. The possibility of occupant submarining increases as the belt angle approaches the horizontal, that is, as the measured belt angle with the horizontal decreases. The potential hazard of submarining is that occupants may suffer abdominal injuries as they slide under their belts.

Standard No. 210 currently specifies a minimum lap belt angle of 20 degrees above the horizontal, measured from the seating reference point to either the anchorage or the point where the safety belt contacts the seat frame. The ECE regulation specifies a minimum lap belt angle of 30 degrees. Since the ECE 30 degree minimum would enhance safety, by reducing the risk of occupant submarining, the NPRM proposed to adopt a 30 degree minimum in Standard No. 210.

Four of the commenters supported the proposal to require a minimum lap belt angle of 30 degrees. These four were Chrysler, Volvo, Volkswagen, and BMW. On the other hand, twelve commenters (Mitsubishi, Honda, Austin Rover, Fiat, Ford, Hino, GM, Toyota, Jaguar, Nissan, Mazda, and Subaru) opposed this proposed change for several reasons. GM commented that "the interrelationship of factors that can contribute to occupant submarining in vehicle crashes is not fully understood." Both Ford and Hino commented that occupant submarining depends on factors other than belt angle.

NHTSA agrees with Ford and Hino that factors other than belt angle, including characteristics of the safety belt webbing, the seat, the occupant, and the type and direction of the crash itself, affect the likelihood of occupant submarining. NHTSA also agrees with GM that the interrelationship of these factors is not fully understood. However, even though other factors can affect the likelihood of occupant submarining and even though the interrelationship of these factors is not yet quantified, the available data show that increasing the minimum lap belt angle will decrease the likelihood of occupant submarining. If all of the other factors that influence submarining are held constant and only the angle of the lap belt is changed, the angle of the lap belt in relation to the constraining forces will greatly affect the likelihood that the belt will ride over the iliac crest (the pelvic bone) in a crash. Too shallow a belt angle results in insufficient downward force to resist the upward motion of the lap belt that results from restraining an occupant in any crash. Since an increase in the minimum lap belt angle from 20 to 30 degrees would reduce the likelihood of occupant submarining, and thereby enhance occupant safety, the fact that other factors might also enhance occupant safety does not seem a compelling reason for not requiring an increase in the minimum lap belt angle.

A number of commenters stated that the ECE regulation requires a minimum lap belt angle of 30 degrees *only* in passenger cars, and even for those vehicles *only* in the front seats. Otherwise, the ECE regulation specifies a minimum lap belt angle of 20

degrees. These commenters suggested that NHTSA should harmonize precisely with the ECE regulation if this rulemaking was to achieve its stated intent.

NHTSA's intent in this and all of its other efforts to harmonize this agency's regulations with those of other nations is to eliminate needless differences between international regulatory requirements applicable to vehicles. However, differences that reflect differing conclusions about the safety need for particular regulatory requirements are not what NHTSA considers to be needless differences.

In this case, NHTSA believes that the available data suggest the desirability of establishing a minimum lap belt angle of 30 degrees for all seating positions, irrespective of the fact that ECE specifies a minimum 30 degree lap belt angle only for front seats in passenger cars. NHTSA test data have shown that the occurrence of occupant submarining is diminished as the lap belt angle is increased. ("Rear Seat Submarining Investigation," DOT HS 807-347, May 1988). Conversely, none of the available data suggest that, all other factors being held constant, the likelihood of occupant submarining in response to a shallow belt angle is any less for rear seat than front seat occupants. To the contrary, the lower pelvis-to-heel position of many rear seat occupants may increase the chance of submarining. The agency does not understand the commenters to be making such an assertion. Instead, NHTSA understands the commenters to be suggesting that the other factors that affect the likelihood of occupant submarining are not constant between the front and rear seat of vehicles. Because adjustments to the other factors can be made to compensate for the lesser lap belt angle, the commenters appear to be suggesting that the likelihood of occupant submarining in the rear seat with a lesser lap belt angle with compensating adjustments to other factors is no more than the likelihood of occupant submarining in the front seat with a greater lap belt angle and no compensating adjustments to other factors.

Even if this suggestion were correct and adjustments could be made to counteract the effects of a lap belt angle less than 30 degrees in the rear seat, NHTSA does not believe this is a persuasive reason to permit a lesser lap belt angle in rear seating positions. In such situations, the likelihood of occupant submarining could be even further reduced by increasing the lap belt angle to 30 degrees or more in those rear seats *together with* the compensating changes to other factors identified by the vehicle manufacturer. Since occupant submarining can result in abdominal injuries for belt users, NHTSA believes it is appropriate to take measures to reduce the likelihood of occupant submarining as much as possible. Therefore, this rule specifies a minimum lap belt angle of 30 degrees in all seating positions.

The maximum lap belt mounting angle requirement in Standard No. 210 affects the forward excursion of an occupant in a crash. The probability of forward excursion increases as the belt angle approaches the vertical (i.e., as the belt angle increases) because the safety belt will rotate about the anchorage before it begins to resist the crash forces. The likelihood of occupant contact with vehicle surfaces, and, therefore, the likelihood of occupant injury, increases as the amount of occupant excursion increases.

Standard No. 210 currently specifies a maximum lap belt angle of 75 degrees, measured from the seating reference point to either the anchorage or the point where the safety belt contacts the seat frame. The ECE regulation permits a maximum lap belt angle of 80 degrees. The NPRM asked for accident and test data on whether increasing the maximum lap belt angle to 80 degrees would significantly increase the forward excursion of belt users. No commenter offered any data in response to this request. Chrysler commented that it had no data on this subject, but that its earlier testing experience showed that occupant excursion may increase with an increase in belt angle. Nevertheless, Chrysler stated that it supported an increase in the maximum lap belt angle to 80 degrees. At least five other commenters suggested that NHTSA should adopt the ECE maximum lap belt angle of 80 degrees, in order to further harmonization.

Harmonization should not result in any lessening of safety protection for vehicles sold in the United States. In this case, all of the available data indicate that occupant excursion increases as the maximum lap belt angle increases. Hence, a maximum lap belt angle of 75 degrees, instead of 80 degrees, reduces the likelihood of adult occupant excursion and injury. Additionally, a paper prepared for the Society of Automotive Engineers concluded that child safety seats have a greater propensity for excursion than do adult belt users, and that a shallower lap belt angle is needed to ensure protection for occupants of child safety safety seats; *see* Weber and Radovich, "Performance Evaluation of Child Restraints Relative to Vehicle Lap-Belt Anchorage Location," SAE 870324. Based on a series of 30 mile per hour (mph) sled tests, the Weber and Radovich paper reports that the amount of head excursion for the test dummy in a child safety seat had almost a linear increase with the increase of the lap belt angle. Against this background, NHTSA has no basis for any further consideration of increasing the maximum lap belt angle from the currently specified 75 degrees.

In summary, the lap belt angle should be optimized below the upper excursion limit of 75 degrees

and above the lower submarining limit of 30 degrees. The data available to the agency indicate that lap belts designed with angles within this range should mitigate both of these potential problems. Requirements for lap belt angles to be greater than 30 degrees or less than 75 degrees are outside the scope of this rulemaking. Should additional information become available on this subject, the agency may readdress this subject in a future rulemaking.

2. *Anchorage Deformation Limits*

While structural deformation of the area around an anchorage can aid in occupant protection by absorbing part of the crash energy, excessive deformation can allow excessive occupant excursion, which would allow a belt user to move forward and contact the vehicle's interior. The only limitation on anchorage deformation currently specified in Standard No. 210 is that the anchorage must not completely separate from the vehicle structure. Anything short of complete separation is permissible. ECE Regulation No. 14, on the other hand, limits the permissible deformation of an anchorage during testing. During the test prescribed in ECE Regulation No. 14, the lap belt anchorages must continue to meet the minimum lateral spacing requirement of the regulation and the upper anchorage for the shoulder belt must remain within the zone specified in the regulation. The agency asked for comments on adopting a similar approach in Standard No. 210.

The idea of limiting the permissible anchorage deformation that occurs during compliance testing was necessarily linked with the proposal to modify the current anchorage strength test specified in Standard No. 210, so that the strength test would attain and impose the load in a manner more representative of actual crash loading. If the loading could be imposed on the anchorage in a way that more closely simulated an actual vehicle crash, limits on the deformation of the anchorage could serve a safety purpose, by helping to ensure that safety belt users would not experience excessive excursion in an actual crash.

As explained above, however, the times during which the load is imposed and held by the anchorage during Standard No. 210 compliance testing is unchanged in this final rule. Because this rule does not reduce the load hold time, NHTSA does not believe there is any practical means of complying with the proposed deformation limit, nor is there any safety need for adding the proposed deformation limit to the standard. Agency compliance testing using the current 10 second load hold time demonstrates that some current designs for anchorages would not comply with the proposed deformation limit. In some compliance tests, deformation has been so severe that the tests had to be interrupted because of excessive instrument travel. The only way for such vehicles to comply with this proposed deformation limit for anchorages would be if much of the vehicle structure supporting the anchorages were redesigned.

It is not clear that real world safety benefits would be realized sufficient to justify imposing a requirement for major redesign of vehicles. The load imposition and load hold times specified for compliance testing are admittedly not directly representative of actual crash conditions. Since the anchorage strength test is not directly representative of actual crash conditions, it is not clear that imposing new deformation limits for the anchorages during that strength test would enhance occupant safety during actual crash conditions. Moreover, the available accident data do not indicate that current vehicles, which are *not* subject to any limitations on anchorage deformation, pose any significant safety risk to occupants wearing safety belts, as a result of excessive anchorage deformation. This suggests that there is no safety basis for changing the existing regulatory structure. Accordingly, no anchorage deformation limits have been adopted in this rulemaking.

3. *Upper Anchorage Location Zone*

As noted in the NPRM, Standard No. 210 and ECE Regulation No. 14 specify limits on the zones in which the upper anchorage for the shoulder portion of lap/shoulder belts can be located. The ECE regulation differs from Standard No. 210 in that the ECE regulation permits an anchorage to be located further forward than does Standard No. 210. In fact, the ECE regulation permits the upper anchorage for a shoulder belt to be located in front of an occupant's shoulder.

The NPRM noted that the agency is aware of test data showing that an anchorage positioned in front of an occupant's shoulder can allow increased head movement and thus potentially increase the risk of head injury. The NPRM identified three different studies that supported this conclusion. On the other hand, the NPRM also noted that the agency was aware of one set of test data indicating that the increased head movement from anchorage locations forward of the shoulder may not significanly increase the risk of head injury. The agency sought comments on whether to adopt the upper anchorage location zone specified in the ECE regulation, and stated in the NPRM that it was particularly interested in receiving additional accident and/or test data on the safety effects of permitting anchorages to be located in front of an occupant's shoulder.

No commenter provided any such data in response to this request. Without discussing any potential safety implications, many of the commenters urged NHTSA to harmonize Standard No. 210's requirements with those in the ECE regulation. As ex-

plained above, NHTSA cannot take any steps to harmonize its safety standards with other countries' vehicle regulations until the agency has carefully considered the safety consequences of such steps. In this case, the data appear conflicting, but the preponderance of the evidence suggests that permitting the upper anchorage to be located in front of an occupant's shoulder would potentially increase the risk of head injury. Until such time as it is clearly demonstrated that permitting anchorage locations in front of an occupant's shoulder does not pose an increased risk of injury, NHTSA believes it is inappropriate to permit such anchorage locations. Hence, this rule makes no change to the location zone currently specified in Standard No. 210 for upper anchorages subject to the standard's location requirement.

4. *Lateral Spacing of Lap Belt Anchorages*

Standard No. 210 currently specifies a minimum lateral spacing of 6.5 inches for lap belt anchorages, while the ECE regulation requires a minimum of 13.75 inches lateral spacing for lap belt anchorages. In the NPRM, the agency stated that it recognized that the closer the spacing of lap belt anchorages, the greater the possibility of increased lateral movement by a belt user during an oblique, side, or rollover crash. In addition, NHTSA stated that closer spacing of anchorages could permit increased side loads on an occupant's pelvis. However, the agency acknowledged that it did not have any data indicating that the possible side loads and lateral movement do, in fact, present an increased risk of injury. Thus, the NPRM asked for comments and data on the effect of anchorage spacing on occupant safety.

Fiat and Volvo commented that they would support an amendment of Standard No. 210 to adopt the ECE anchorage spacing requirement, although neither commenter provided any data to support such an amendment. Fiat repeated the agency's assertion that close spacing of lap belt anchorages could permit increased side loading. Volvo asserted that wider spacing of lap belt anchorages would enable the lap belt to "better secure child safety seats," but did not explain why this would be so. NHTSA assumes that Volvo was alluding to the issue of sideward excursion that was noted in the NPRM for adult users of the safety belt.

On the other hand, several commenters suggested that there was no need to change the existing lap belt anchorage spacing requirement. GM commented that further study is needed before considering any changes. Similarly, Navistar commented that the agency should have sound data before making any change to the anchorage spacing requirements. Blue Bird commented that the ECE 13.75 inch spacing for lap belt anchorages would "be difficult to accomplish" for school bus seats, because those seats are generally designed to allow 13.0 inch rump room for passengers. Chrysler commented that there are no data showing a safety need to increase the anchorage spacing from the 6.5 inches that has been specified for the past 20 years. Ford also commented that there were no safety data showing the need for a change, and added that a requirement for 13.75 inch anchorage spacing would require a redesign in current vehicles with center seating positions.

NHTSA agrees with the commenters that stated that there should be a sound safety basis for a requirement that will force manufacturers to change vehicle designs, particularly when such designs have been expressly permitted by the safety standards for the preceding 20 years. With respect to lap belt anchorage spacing, there are three possible safety considerations that could serve as a basis for increased anchorage spacing. First, closer spacing could permit increased lateral movement in an oblique, side, or rollover crash. Even accepting this as true, NHTSA is unaware of any data, from either laboratory testing or real world crashes, that indicate a serious risk of injury as a result of this increased lateral movement. Given the number of vehicles that have used anchorage spacing narrower than is specified by ECE, especially at center seating positions, it seems reasonable to conclude that the absence of any data to the contrary shows that the anchorage spacing currently specified in Standard No. 210 does not permit any serious risk of injury to motor vehicle occupants as a result of lateral movement in crashes. Second, closer spacing of lap belt anchorages could create injurious inward sideloading on the pelvis of the occupant during a frontal crash. However, the agency's examination of accident data and studies indicates that, to the extent belt users experience pelvic injuries like hip dislocations and fractures, those injuries are the result of the crash forces driving the occupant's knee back into the hip, *not* the safety belt loads being applied directly to the hip. *See, e.g.,* Otte, Dietmar, "Residual Injuries to Restrained Car Occupants in Frontal and Rear Seat Positions," Accident Research Unit, Hannover, West Germany (May 1987). This being the case, there is no reason to believe that a regulatory change to reduce potential inward belt loading on the pelvis, by mandating the wider anchorage spacing in the ECE regulation, would achieve any significant reduction in the number of pelvic injuries to occupants. Third, the possibility of submarining was investigated in a research study (Leung, C.Y., *et al.,* "Submarining Injuries of 3 Point Belted Occupants in Frontal Collisions—Description, Mechanisms, and Protection," SAE 821158). After a series of tests, the Leung study found that the likelihood of occupant submarining decreases as the lap belt anchorage spacing decreases. Hence, adopt-

ing the wider anchorage spacing specified in the ECE regulation would not reduce the likelihood of occupant submarining.

NHTSA also notes that the narrower spacing requirement in Standard No. 210 gives manufacturers more design latitude than the corresponding ECE requirement. Manufacturers that wish to certify compliance with the anchorage spacing requirements in both Standard No. 210 and the ECE requirements can do so by merely spacing the anchorages in its vehicles more widely than the ECE's minimum 13.75 inches.

Since the agency is not aware of evidence showing any significant safety benefits that would be associated with the ECE lap belt anchorage spacing requirements, and adopting the ECE lap belt minimum anchorage spacing requirements would impose some additional costs by requiring modifications to some existing vehicle designs, this rule does not make any changes to the minimum lap belt anchorage spacing requirements currently specified in Standard No. 210.

5. *Simultaneous Testing of Anchorages*

Standard No. 210 currently requires that all *floor-mounted* anchorages for *adjacent* designated seating positions be tested simultaneously for anchorage strength. ECE Regulation No. 14 requires that *all* anchorages common to a single seat assembly, whether floor-mounted or mounted on the seat frame, be tested simultaneously. This ECE requirement ensures that the anchorages for all *three* seating positions on a standard passenger car bench seat will be tested simultaneously. In the NPRM, the agency noted that the requirement in the ECE regulation is more representative of a real-world crash in which all seating positions are occupied. Accordingly, the agency proposed to adopt a requirement that all anchorages common to one seat be tested simultaneously.

Five commenters addressed this proposal. Three of the commenters (Volvo, Austin Rover, and Chrysler) supported the proposal for the reasons set forth in the NPRM. Ford also commented that it supported the proposal, but asked for some clarification of the relationship between the compliance testing for Standard No. 210 and that specified in Standard No. 207, *Seating Systems* (49 CFR 571.207). Section S4.2(c) of Standard No. 207 provides that, if the seat belt assembly is attached to the seat being tested, the forces specified for Standard No. 207 compliance testing shall be applied simultaneously with the forces specified for Standard No. 210 compliance testing of the seat. Ford asked that Standard No. 210 be amended to provide that the Standard No. 207 compliance test forces be applied simultaneously with those of Standard No. 210. No such change has been made, because Standard No. 207 already contains a provision for simultaneous testing. Therefore, NHTSA does not believe a conforming cross-reference in Standard No. 210 is necessary. Ford also asked that Standard No. 207 be amended to provide that a seat that has been subjected to the simultaneous loading need not pass any further seat loading tests. Whatever the merits of this request, it is outside the scope of this rulemaking action.

Blue Bird, a manufacturer of school buses, commented that a requirement for simultaneous testing of all anchorages common to one seat assembly, regardless of whether the anchorages were mounted on the vehicle floor or the seat frame, "would be extremely difficult and expensive to meet." Blue Bird "strongly requested" that a requirement for simultaneous testing of all anchorages for any given seat assembly be carefully studied and the safety need conclusively established before making this requirement applicable to passenger seats on school buses.

Section S4.1.2 of Standard No. 210 provides that school buses with a gross vehicle weight rating (GVWR) of more than 10,000 pounds are *not* required to have anchorages installed for the passenger seats. Any anchorages that are installed for passenger seating positions in those school buses would be purely voluntary, and not in response to any regulatory requirement. Thus, any anchorages for safety belts that are installed on the passenger seats in large school buses are not subject to any of the anchorage requirements specified in Standard No. 210.

This is not the case for anchorages installed for the passenger seats in school buses with a GVWR of 10,000 pounds or less. Those seats are required by section S5(b) of Standard No. 222, *School Bus Passenger Seating and Crash Protection* (49 CFR 571.222) to comply with the requirements of Standard No. 210 as those requirements apply to multipurpose passenger vehicles. Accordingly, S4.1.2 of Standard No. 210 requires that anchorages for either a lap-only belt or a lap/shoulder belt be installed for each passenger seating position in small school buses. Thus, a forward-facing bench seat on a small school bus that has three passenger seating positions would be tested by simultaneously loading the anchorages for all three of those passenger seating positions.

NHTSA believes it is appropriate to require simultaneous testing of anchorages for the passenger seats in small school buses for a number of reasons. First, a requirement for simultaneous testing of passenger seat anchorages is more representative of real world crash conditions with all seating positions occupied for small school buses, just as the simultaneous testing requirement is more representative of real world crash conditions with all seating positions occupied in passenger cars and light trucks.

Second, the failure to require simultaneous testing of anchorages for the passenger seats in small school buses would erode the level of safety protection afforded to passengers in those small school buses. The agency based its recent decision to exempt small school buses from the requirements for rear seat lap/shoulder belts by explaining that occupants in small school buses have the occupant protection of *both* lap-only safety belts and compartmentalization; 54 FR 46257, at 46260–46261, November 2, 1989. If the anchorages for the lap belts at the passenger seating positions were now to be exempted from the simultaneous anchorage strength testing requirement, the passengers in small school buses might not have the occupant protection of lap-only safety belts in situations where all the positions on a seat were occupied. The agency believes that occupants of small school buses need the protection of *both* safety belts and compartmentalization for effective occupant protection in these lighter vehicles.

Third, NHTSA believes it is feasible and practicable for manufacturers of small school buses to design passenger seats and anchorages that can withstand simultaneous testing of anchorages under Standard No. 210 *and* exhibit the force deflection characteristics specified for compartmentalization under Standard No. 222. Engineering principles suggest that one could design the legs of the seat to sustain the anchorage strength test load, if the anchorages were mounted on the seat, and design the seat back to deform according to Standard No. 222's deflection requirements. Additionally, agency testing has confirmed that some existing van seats with anchorages mounted on the seats comply with Standard No. 210's anchorage strength requirements when all the seat-mounted anchorages were tested simultaneously.

Additionally, this rule clarifies the existing requirement for simultaneous testing for all "adjacent" designated seating positions. The term "adjacent" is imprecise. For example, "adjacent" could be misinterpreted as specifying simultaneous testing for front and rear outboard seating positions on the same side of the vehicle, or it could be misinterpreted as specifying simultaneous testing for bucket seats in the front that are not separated by a console or some other structure. This rule more precisely expresses the agency's intention by deleting the reference to simultaneous testing of "adjacent" designated seating positions, and substituting a requirement for simultaneous testing of all designated seating positions that face in the same direction and are common to the same occupant seat.

C. *Limitation on Anchorage Movement During Static Test*

The NPRM also proposed an alternative under which the static testing requirements in Standard No. 210 would be retained, but some limitations on anchorage movement during that testing would be added. For the reasons explained above in the discussion of adopting the ECE limitations on anchorage deformation, NHTSA has decided not to adopt any limitations on anchorage deformation during the testing specified in Standard No. 210. Hence, this alternative proposal for anchorage deformation limits is not adopted in this final rule.

II. *Automatic Belt Anchorage Strength*

In the NPRM, NHTSA proposed to clarify the strength requirements for anchorages for automatic belts. The agency noted that its interpretations have long stated that anchorages for automatic belts are required to meet the strength requirements set for the anchorages for manual lap/shoulder safety belts, instead of the strength requirements set for the anchorages for manual lap-only safety belts. The notice proposed to expressly incorporate this interpretation into the standard.

Several manufacturers commented that anchorages for automatic belts should be exempted from the strength requirements of Standard No. 210. NHTSA did not propose such a change, because NHTSA does not believe such a change would advance the interests of safety. For the same reasons set forth above in explaining why this rule does not exempt from the strength requirements the anchorages for dynamically tested manual belts, the agency believes it would be similarly inappropriate to exempt the anchorages for automatic belts from the strength requirements of Standard No. 210. As proposed, the specific strength requirements adopted in this rule for automatic belt anchorages are the same requirements that currently apply to anchorages for manual lap/shoulder safety belts.

III. *Deletion of Manual Belt Anchorages for Automatic Belt Vehicles*

Section S4.1.1 of Standard No. 210 currently requires anchorages for manual lap/shoulder safety belts to be installed for all front outboard seating positions in passenger cars. Section S4.1.4 of Standard No. 208, *Occupant Crash Protection* (49 CFR 571.208), requires that front outboard seating positions in passenger cars manufactured on or after September 1, 1989 be equipped with automatic crash protection. (The front outboard passenger's seating position in these cars may be equipped with a dynamically tested manual lap/shoulder safety belt if the driver's position is equipped with an air bag and the car is manufactured before September 1, 1993.) NHTSA has expressly exempted the anchor-

ages for automatic or dynamically tested manual safety belts from the anchorage location requirements in Standard No. 210. Thus, the anchorages to which automatic or dynamically tested manual safety belts originally installed in a vehicle are attached are not required to comply with the location requirements of Standard No. 210.

However, if the anchorages for any automatic or dynamically tested manual safety belts originally installed at front outboard seating positions in a passenger car do not comply with the location requirements of Standard No. 210, the standard provides that anchorages for a manual lap/shoulder belt that comply with the anchorage location requirements must also be installed at that seating position. NHTSA justified this requirement for seemingly redundant anchorages by explaining that this requirement would allow owners to replace damaged automatic belts with manual lap/shoulder belts if they so desired.

The agency reexamined this requirement in response to a petition for rulemaking on this subject submitted by GM. This reexamination led the agency to propose to delete the requirement for complying anchorages to be provided at seating positions originally equipped with safety belts that did not make use of anchorages within the locations permitted in Standard No. 210 (i.e., automatic or dynamically tested manual safety belts). This proposal reflected the agency's tentative conclusions that:

a. NHTSA is unaware of any widespread demand for alternative types of belt systems when replacing damaged safety belts. Instead, the agency anticipates that consumers would opt to simply have a replacement safety belt system installed similar to the belt system with which the car was originally equipped. Hence, the potential benefits of a requirement for redundant anchorages would accrue very infrequently, if ever.

b. It is possible that a manual lap/shoulder safety belt would not provide adequate occupant protection at a seating position originally equipped with automatic or dynamically tested manual safety belts. For instance, the manufacturer might install an automatic or dynamically tested manual belt system that had particular elongation patterns or limited webbing spoolout, so as to adapt the safety belt system to the needs of that particular seating position. A manual lap/shoulder belt that complied with the general requirements of Standard No. 209 might not have the same attributes as the original belt system. In this case, use of a different type of belt system than that with which the vehicle was originally equipped could lessen the crash protection afforded to occupants of the car.

The NPRM took care to emphasize that this proposal would not affect the requirement in section S7 of Standard No. 210 that anchorages for a manual lap belt must be installed at the front right seating position if the automatic crash protection system cannot be used to secure a child seat and if a manual lap-only or lap/shoulder belt is not installed at that seating position. In those instances, anchorages for a manual lap belt ensure that a child seat can be properly secured at the right front seating position. NHTSA did not propose to amend that requirement.

All of the commenters that addressed this issue supported the proposed deletion of the requirement for redundant anchorages. This final rule adopts the proposed deletion of the requirement for those redundant anchorages. Additionally, since this relieves an obligation that requires vehicles to have unnecessary equipment that might result in lesser occupant protection, NHTSA finds for good cause that this deletion should be effective immediately upon publication of this rule in the *Federal Register*.

IV. *Test Anchorage With Seat in Its Rearmost Position*

Mercedes Benz filed a petition asking the agency to revise the seat location requirement currently specified to determine if the upper anchorage for a lap/shoulder safety belt complies with the anchorage location requirements of Standard No. 210. The standard currently provides that the determination will be made with the seat in its full rearward and downward position and with a two-dimensional manikin positioned with its torso line at the same angle from the vertical as the seat back and with its "H" point located at the seating reference point. (The "H" point simulates the location of the hip joint, and the seating reference point is the manufacturer's design reference point that determines the rearmost normal driving position of the seat.) Mercedes' petition asserted that vehicles with extended seat track travel would have a seating reference point several inches forward of the seat back of an adjustable seat adjusted to its rearmost position.

Mercedes filed another petition asking the agency to revise the definition of "seating reference point" in 49 CFR 571.3. This petition and the effects that a revision of the definition of "seating reference point" would have on compliance with the safety standards other than Standard No. 210 are being addressed in a separate rulemaking action. *See* 51 FR 20536; June 5, 1986.

Both in that separate rulemaking action and in the NPRM for this rule, NHTSA explained that the agency believes that positioning of the seat for the purposes of determining a vehicle's compliance with the upper anchorage location requirements of Standard No. 210 should be treated differently than the

positioning of the seat for other standards or the positioning of the seat to determine a vehicle's compliance with the minimum and maximum lap belt mounting angles. As explained above, NHTSA wants to ensure that the upper anchorage of a lap/shoulder belt cannot be positioned significantly in front of an occupant's shoulder, because such a positioning could allow increased head movement and increased risk of injury. To ensure that upper anchorages will not be positioned significantly forward of an occupant's shoulder, NHTSA believes it is appropriate to adjust the seat to its most rearward position to determine if the vehicle complies with the upper anchorage location zones specified in Standard No. 210.

In the NPRM for this rule, NHTSA stated that it would use the "existing seating reference point" to determine whether a lap belt or the lap belt portion of a lap/shoulder belt meets the minimum and maximum mounting angle requirements in Standard No. 210. The NPRM acknowledged that the seating adjustment position in which the existing seating reference point is determined "may not be the rearmost position." If the seating reference point is defined with the seat in some position other than the rearmost, the current requirement in S4.3.2 of Standard No. 210 for determining compliance with the upper anchorage location requirements (the seat in its full rearward position *and* the manikin's "H" point at the seating reference point) appears to allow the upper anchorage to be positioned significantly forward of an occupant's shoulder, notwithstanding NHTSA's repeated statements that it wants to prohibit such anchorage locations.

The reason for this apparent anomaly is that the seating reference point simultaneously defines two dependent variables. These variables are:

1. the adjustment position of the seat (rearmost *normal* driving or riding position), *and*

2. the location of the manikin's "H" point relative to the seat cushion and the seat back.

The anomaly in Standard No. 210 arises because the standard attempts to use the seating reference point to define only one of these variables (the location of the manikin's H point), and to establish a definition for the other variable different than that which is specified for the seating reference point (the adjustment position of the seat). Specifically, section S4.3.2 of Standard No. 210 refers to the seating reference point as the location for the manikin's "H" point, while specifying a seat adjustment position (full rearward and downward position) different from that which is specified for the seating reference point.

In those vehicles in which the seating reference point is determined when the seat is adjusted to a position *forward* of the rearmost seat adjustment position, the seating reference point would be located several inches forward of where the seat back would be located when the seat is in the rearmost position. When the procedures of Standard No. 210 for positioning the two dimensional manikin with its torso line at the same angle from the vertical as the seat back and its "H" point located at the seating reference point are followed for such vehicles, the result is that the manikin's torso line is located not tangent to, but several inches *forward* of and parallel to the seat back. The acceptable upper anchorage location zone shown in Figure 1 of Standard No. 210 would also move forward several inches to correspond to this manikin positioning. While the resulting anchorage location would be suitable when the seat is adjusted so that it is at or forward of the seating adjustment position in which the seating reference point was determined, the location might be unsuitable when the seat is adjusted so that it is to the rear of that seating adjustment position.

To eliminate the potential for confusion, this rule deletes the existing requirement in S4.3.2 that the manikin's "H" point be located at the seating reference point. As proposed in the NPRM, this rule substitutes a requirement that the manikin's "H" point shall be at the "design H point of the seat in that seating position, as defined in SAE Recommended Practice J1100 (June 1984)." Unlike the seating reference point approach which establishes the location of the manikin's "H" point at only one seat adjustment position, the "design 'H' point" approach can be used to establish the location of the manikin's "H" point at *any* seat adjustment position. Section S4.3.2 continues to specify the same seat adjustment position, i.e., the seat must be in the full rearward and downward position.

V. *Compliance Test Equipment*

The NPRM described the Standard No. 210 compliance testing problems the agency had experienced. NHTSA stated that the problems resulted mainly from excessive side loads induced by the body block used in the test procedure to simulate the human torso. However, other problems were attributed to belt webbing elongation, deformation of the vehicle structure, and lack of adequate distance to pull the body block in smaller vehicles. NHTSA proposed some changes specifically to address these testing problems.

A. *Use of Cables*

At present, Standard No. 210 implies that the safety belt assemblies installed in the vehicle will be used during compliance testing to transfer the test load from the body block to the anchorage. To reduce testing problems that result from the interaction between the safety belts and the test equipment, the

agency proposed to use cables (wire rope) instead of the vehicle's safety belts for compliance testing. Before proposing this change, NHTSA conducted a test program showing that Standard No. 210 compliance testing results using cables were comparable to the testing results obtained using the vehicle's safety belts.

Nearly all of the commenters that addressed this proposal opposed a change to the exclusive use of cables instead of safety belt webbing. Some commenters alleged that cables would concentrate the specified loading over a much smaller area than would occur if the loading were applied by the webbing of the safety belt installed in the vehicle. Because of this concentrated loading, these commenters alleged that loading imposed by means of cables would be so unrepresentative of loading imposed by safety belt webbing that cables should not be used for compliance testing. Other commenters, including Mercedes, suggested that the proposed use of cable instead of webbing would have only minor effects on the test results. However, these commenters suggested that the standard should permit the optional use of either cables or safety belt webbing for compliance testing. Further, some other commenters, including Chrysler, suggested that the agency could achieve its aim of reducing the number of compliance tests that cannot be completed without introducing the more concentrated loading that would result from the use of cable. These commenters recommended that Standard No. 210 specify the use of high-strength, low-elongation safety belt webbing for its compliance tests.

NHTSA was aware that connecting the cables directly to the anchorage being tested could produce loading on the anchorages that might be unrepresentative of loading that would result if the same force levels were applied to the anchorages by means of webbing. The proposal was not intended to result in compliance testing where the cables would be connected directly to the anchorage fixture. Instead, NHTSA intended to use an adapter plate to connect the cables to either the attachment hardware or the webbing of the belt system installed in the vehicle. This adapter plate would have the same geometry as a D-Ring on a belt system, and would have distributed the load evenly across the width of the webbing or the attachment hardware. The agency believes that the commenters' assertion of unrepresentative loading was based upon a misunderstanding of the proposal.

The proposal to use cables for compliance testing was intended to ensure that the results of those tests would be determined by the properties of the anchorage fixtures being tested, and that those tests would not have to be terminated before completion because of the properties of the safety belt systems installed in the vehicles. This intent can be effectuated by substituting any high-strength, low-elongation material for the webbing of the vehicle's safety belts in situations where prior experience indicates that the original equipment belt webbing will fail during compliance testing. NHTSA is using the term "high strength" to refer to any material that is stronger than the maximum load imposed during the compliance test. The term "low elongation" means a material that has no more stretch over the range of loads specified in compliance testing than typical original equipment polyester safety belt webbing. Typical polyester belt webbing has a breaking strength of approximately 7,000 pounds and an elongation of seven percent when subjected to a 2,500 pound load. NHTSA does not believe that cables would better serve the agency's purposes than any other high-strength, low-elongation material, such as chains or polyester belt webbing. Similarly, NHTSA believes that any high-strength, low-elongation material will produce comparable test results to the results that would be obtained using cables.

The agency agrees with the commenters that compliance testing should not result in unrealistic loading for the anchorages. To ensure realistic loading of the anchorages, the NPRM proposed to expressly provide in Standard No. 210 that the load would be transmitted to the anchorages by means of the original equipment safety belt attachment hardware in the vehicle. This proposal was intended to ensure that the anchorage loading during compliance testing would be identical to that which would be experienced by the anchorages if the compliance testing were conducted with the original equipment safety belt system in its entirety. To further ensure that the loading imposed during compliance testing is a realistic simulation of actual anchorage loading, this rule specifies that the material used to apply the load to the anchorages in compliance testing, whether it be cables, chains, or webbing, be equal to or greater in strength than the original equipment webbing and that the material used to apply the load to the anchorages shall duplicate the geometry of the original equipment webbing at that seating position.

B. *Test Block Width*

Standard No. 210 currently specifies that a body block 20 inches long by 14 inches wide shall be used in compliance testing for lap belt anchorages and the pelvic portion of lap/shoulder belt anchorages. The NPRM noted that the 14 inch width of the current body block can preclude the simultaneous testing of safety belt anchorages for all three seating positions in the rear seat of smaller cars. To address this problem, the NPRM proposed to reduce the body block's dimensions to 13 inches long by 10 inches wide. The proposed width reduction was intended to

make it easier to simultaneously test anchorages for rear seating positions in smaller cars. The proposed length reduction was intended to provide more total pull distance in both front and rear seats, thereby making it easier to conduct the strength tests. NHTSA acknowledged that the proposed reduction in the size of the body blocks would result in a very small reduction in the longitudinal load applied to the anchorage. However, the agency noted that the overall load input would be unchanged.

Nearly all of the commenters that addressed this proposed reduction in the size of the body block opposed the change. Only BMW commented that it had no objection to this proposal, although that commenter suggested that the use of the smaller body blocks be made optional with the manufacturer. The other commenters raised various objections to the proposal.

First, many commenters argued that the smaller body blocks would move Standard No. 210 away from harmonization with the ECE regulation, which uses 20 inch by 16 inch body blocks for its lap belt anchorage testing. This argument was not persuasive. Standard No. 210 currently specifies that 14 inch wide body blocks will be used in compliance testing. This requirement is not harmonized with the ECE regulation's specification of 16 inch wide body blocks. It does not appear feasible to move Standard No. 210 toward the wider body blocks used by the ECE, considering the testing problems that have been encountered with the current body blocks that are already narrower than the ECE body blocks. The proposed reduction in size to even narrower 10 inch wide body blocks would remain not harmonized with the ECE 16 inch wide body blocks, but would reduce the testing problems encountered with the current 14 inch wide body blocks. Thus, the current and proposed absence of harmonization between Standard No. 210 and the ECE regulation is not unnecessary nor is it an oversight. Instead, it reflects actual problems that have arisen in compliance testing.

Second, many commenters argued that the smaller body bock would produce unrealistic loading on the anchorages. The reduction in width of the body block will cause the load to be applied in a direction that is five to ten degrees further away from directly forward of the anchorage. NHTSA agrees that, as the angle of the force application deviates from the directly forward direction, an actual increase in the resultant vector in the direction of the force applied will be created. This means that the anchorages being tested will experience slightly higher forces as less wide body blocks are used to apply the forces, even though the overall force remains constant.

However, NHTSA does not believe these slightly higher forces are significant enough to produce differing test results. The 10 inch wide body bocks would produce forces on the lap belt anchorages during compliance testing that are approximately two percent greater than would be imposed on those anchorages by using 14 inch wide body blocks during compliance testing. Although commenters asserted that this increase could force redesign of the anchorages in some vehicles, no commenter offered any examples of particular vehicles whose anchorages would have to be redesigned.

Additionally, NHTSA does not believe that the reduced body block size is unrepresentative of potential vehicle occupants, since many children have a pelvic width of 10 inches or less. For instance, the hip breadth of a sitting 50th percentile 6-year-old child is 8.4 inches. The hip breadth of a sitting 5th percentile adult female is 12.8 inches. Given these facts, the argument that the 10 inch wide body block would be unrepresentative of persons likely to occupy the seating position is not convincing.

Third, several commenters questioned the need for smaller body blocks for various reasons. Some commenters, including Mitsubishi, asserted that they had not encountered any difficulties in conducting certification testing in the rear seats of even their subcompacts using the procedures currently specified in Standard No. 210. Such assertions are contrary to the agency's experience, because NHTSA has encountered difficulties conducting compliance testing in the rear seat of smaller cars, as stated in the NPRM. The agency believes it must make some changes to the compliance testing procedures set forth in the standard to minimize difficulties in such testing, regardless of the manufacturers' experiences during their certification testing of their particular models.

Other commenters, including Ford, asserted that the compliance testing problems that led the agency to propose the use of smaller body blocks would be alleviated by other changes proposed in the NPRM. It was asserted that, when these other changes were adopted, there would be no further need for the smaller body blocks in compliance testing. In response to these allegations, the agency has analyzed this rule and concluded that there may still be instances where the smaller body blocks will be needed, but those instances will be less frequent. Accordingly, this rule adopts a provision permitting the use of the smaller body blocks.

Even though NHTSA has concluded that the arguments set forth in the comments are not persuasive reasons for *prohibiting* the use of smaller body blocks in compliance testing, the agency is reluctant to *require* the use of smaller body blocks in the face of these arguments. The reason for proposing to use smaller body blocks was solely to reduce compliance testing

problems. The smaller body blocks were not intended to address any specific safety concerns or otherwise impose more stringent testing requirements. To the extent that the smaller body blocks impose more stringent requirements, even if the increase in stringency is insignificant, this is unintended.

This final rule includes two additional provisions to ensure that no unintended impacts will result from the use of smaller body blocks. First, the smaller body block will be used only in the center seating position(s) of three or more simultaneously tested sets of anchorages. This will ensure that the smaller body block is used only when it might be necessary to do so. Second, the use of the smaller body block at the center seating positions will be at the option of the vehicle manufacturer. This will ensure that the smaller body block is used for testing only when the vehicle manufacturer chooses to specify the use of the smaller body block. These two new provisions allow the agency to ensure that no additional burdens will be imposed on any party as a result of the use of smaller body blocks.

VI. *Clarification of Compliance Failure*

In the agency's compliance testing for Standard No. 210, there have been instances in which the safety belt attachment hardware or attachment bolts have broken before the maximum test load had been applied to the anchorage. However, the agency's ability to take effective corrective action was hindered by the fact that it is not clear under the existing language of Standard No. 210 that such failures are noncompliances with the standard, since the standard sets performance requirements for anchorages.

The agency tentatively concluded that it was necessary to amend Standard No. 210 to assure the proper performance not only of the anchorage fixture, but also of the belt assembly attachment hardware and bolts. The strength requirements of Standard No. 210 were intended to ensure that the safety belt system will remain attached to the vehicle and not break free, even when exposed to severe crash forces. Obviously, the safety belt system will *not* remain attached to the vehicle if the anchorage fixture successfully withstands the crash forces, but the hardware attaching the belt system to the anchorage fixture fails when exposed to these crash forces.

Accordingly, the NPRM proposed to amend Standard No. 210 to explicitly provide that the attachment hardware, the attachment bolt, and the anchorage fixture itself must all comply with the performance requirements for anchorage strength.

Most of the commenters that addressed this proposal opposed it. The most frequently stated reason for opposing this change was that Standard No. 209, *Seat Belt Assemblies*, already establishes performance requirements for the strength of anchorage hardware.

One of the commenters asked if NHTSA was using the term "attachment hardware" in this proposal to mean the same thing that this term means when used in Standard No. 209. Section S3 of Standard No. 209 defines attachment hardware as "any or all hardware designed for securing the webbing of a seat belt assembly to a motor vehicle." The answer to this question is yes, "attachment hardware" is used with the same meaning in Standards No. 209 and 210.

This commenter and others suggested that it was unnecessary to impose a second strength requirement on the attachment hardware. NHTSA did not find these comments persuasive. As explained earlier in this preamble, the test conditions in Standard No. 210 are not intended to simulate an actual vehicle crash. Instead, the test conditions in Standard No. 210 are intended to subject the safety equipment to force or exposure levels that are sufficiently high that one can reasonably conclude that the equipment is unlikely to fail as a result of exposure to severe crash forces or severe environmental conditions. NHTSA believes it is important to expose both the anchorage itself and the connection(s) between that anchorage and the safety belt assembly, including the connection between the attachment hardware and the anchorage, to these high force levels. Such exposure indicates that the safety belt system will remain attached to the anchorage when exposed to crash forces. Although requiring the attachment hardware to be tested under Standard No. 210 may appear redundant of the existing requirement that the attachment hardware comply with the requirements of Standard No. 209, these tests actually demonstrate a continuum of strength necessary for occupant protection. Accordingly, S5 of Standard No. 210 is amended to explicitly provide that the attachment hardware and the attachment bolt must comply with the performance requirements for anchorage strength in Standard No. 210.

VII. *Issues Not Directly Discussed in the NPRM*

A. *Vehicles with a GVWR in Excess of 10,000 Pounds*

Several commenters asked that the agency consider harmonizing the anchorage strength requirements more fully with the ECE regulations as applied to heavy vehicles (those with a gross vehicle weight rating [GVWR] of more than 10,000 pounds). The commenters noted that ECE Regulation No. 14 permits the anchorages on heavy vehicles to be subjected to forces during strength testing that are one-half of the forces to which the anchorages on passenger cars are subjected. The justification for

this reduction in force for heavy vehicle anchorages is that, in a crash situation, the greater mass of these heavy vehicles will result in deceleration at a much slower rate than that of smaller vehicles, which in turn will subject the vehicle occupant and the vehicle safety belt assemblies and anchorages to lesser crash forces.

NHTSA agrees that the loads experienced by the anchorages in heavy vehicles during crashes are generally less than the loads experienced by lighter vehicles during similar crashes. However, the questions of whether to establish different loading requirements during the strength test for anchorages in heavy vehicles, and, if so, what different requirements are appropriate, were not within the scope of this rulemaking. The agency is currently examining the question of the appropriate compliance test levels for heavy vehicles, including the safety belt anchorages in those vehicles. NHTSA will address this topic in a later rulemaking action devoted to this topic.

Further, several commenters raised questions about seat adjusters on pedestal seats in heavy vehicles (i.e., seats that include a suspension system and that are mounted on a pedestal-like structure). Flxible correctly stated in its comments that Standard No. 210's anchorage strength test requires that the seat be in its rearmost position. According to this commenter, many suspension systems on heavy vehicle seats allow seat movement in both the vertical and horizontal directions. For most designs of seats with suspension systems, a tether strap is used to connect the movable part of the seat to the vehicle structure. This tether strap is designed to be slack at all times to allow the movable part of the seat to move freely in both the vertical and horizontal directions. In order to put the seat in its rearmost position to test the anchorage strength, the tether must be adjusted to be taut so that the seat does not move horizontally to some position forward of its rearmost position. Flxible commented that while this allows the agency to test suspension seats in the same way as it tests seats without a suspension system, it also results in testing suspension seats and safety belt anchorages in a way that is totally artificial and not representative of how that seat and anchorage would react in a real vehicle crash situation.

Again, this concern is outside the scope of this rulemaking action. However, Standard No. 210 compliance testing is conducted simultaneously with the compliance testing for Standard No. 207, *Seating Systems.* In an August 3, 1988 letter to Mr. Barry Nudd, the agency explained in detail the procedures it uses for Standard No. 207 compliance testing of pedestal seats with seat adjusters that are installed in heavy vehicles. The agency promised in the Nudd letter to initiate rulemaking on Standard No. 207's requirements for pedestal-type seats. As a part of that rulemaking, NHTSA will also address the appropriateness of the existing requirements in Standard No. 210 for pedestal-type seats.

B. *Leadtime*

The agency proposed to make these changes effective very soon after publication of a final rule, because the agency believed that the changes would just simplify the compliance test procedures and promote the international harmonization of vehicle safety requirements. NHTSA did not believe that any design changes would have to be made to existing vehicles in response to this rule. Accordingly, the agency believed that the only leadtime that would be needed would be the time to institute changes in the compliance test procedures.

However, many commenters argued that these agency beliefs were incorrect. Several commenters stated that some vehicle models would have to be redesigned in response to this rule, and that the redesign would require more time than was proposed in the NPRM. The leadtime said to be necessary to accommodate the redesigns ranged from 18 months, in the comments of Mazda and Subaru, to 4 years, in the comments of Nissan and Toyota. The agency was persuaded by these comments that more leadtime is necessary, especially since some modifications of existing designs may be needed as a result of the amendment to the minimum lap belt mounting angle incorporated in this rule. Therefore, this rule will not become effective until September 1, 1992. The agency has concluded that this period of leadtime will allow manufacturers to make the necessary changes without imposing an unnecessary burden.

Economic and Other Impacts of This Rule

NHTSA has evaluated the impacts of this final rule and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation's regulatory policies and procedures. The new requirement for a minimum lap belt angle of 30 degrees will require modifications to some current vehicles that have lap belt angles of less than 30 degrees. However, the agency believes any such modifications that are necessary for current vehicles do not require any extensive redesign of the vehicle. These modifications can be made with minimal costs and burdens as a part of the minor changes that are routinely made to vehicles between model years. Since this rule allows such modifications to be made at any time before September 1, 1992, the costs and burdens of making the modifications will be minimal. NHTSA estimates that the

costs of these modifications will average between $1.40 and $3.80 per affected vehicle.

The requirement for simultaneous testing of the anchorages for all seating positions that face in the same direction and are common to the same occupant seat could force design changes to such anchorages mounted on the seat frame, because such anchorages were not subject to the simultaneous testing requirement before the effective date of this amendment. However, testing done both by this agency and by manufacturers has shown that it is feasible to design seats for passenger cars and vans, *including* small school buses, that can withstand simultaneous testing of anchorages under Standard No. 210, testing of the seat under Standard No. 207, and testing of the seat back under Standard No. 222. While there will be some costs and burdens for the manufacturers whose vehicles are not already equipped with anchorages and seats that can comply with the simultaneous testing requirement, those costs and burdens will not be significant. Instead, those manufacturers will incur the costs that have already been voluntarily incurred by many of their competitors.

Simultaneous testing of seat mounted anchorages in small school bus seats might increase prices of those buses by between $36 and $320 per bus, for total costs of from $183,600 to $1,632,000. Because the elasticity of demand for school buses is very low, these increased prices are not anticipated to have any significant effect on school bus sales. Likewise, no significant impacts are anticipated for school bus manufacturers.

The deletion of the requirement for redundant anchorages in vehicles equipped with automatic safety belts will result in some minimal cost savings for the manufacturers of vehicles equipped with automatic safety belts. However, this savings will be minimal, since it will only reflect the materials cost of the redundant anchorages, estimated by NHTSA to be not more than $1.00 per vehicle. Since as many as 4 million passenger cars per year could avoid these costs, a total cost savings of $4 million might result from this deletion of the redundant anchorage requirements.

Considering all these factors together, NHTSA estimates that if the estimated costs and other burdens are at the high end of the range, this rule will impose a net cost increase of $411,000. If the actual costs associated with this rulemaking are at the lower end of the estimated range, a net cost savings of up to $3.3 million could be realized.

In consideration of the foregoing, 49 CFR 571.210 is amended as follows:

1. S4.1.3 of Standard No. 210 is revised to read as follows:

S4.1 *Type.*

* * *

S4.1.3 (a) Notwithstanding the requirement of S4.1.1, each vehicle manufactured on or after September 1, 1987 that is equipped with an automatic restraint at the front right outboard designated seating position, which automatic restraint cannot be used for securing a child restraint system or cannot be adjusted by the vehicle owner to secure a child restraint system solely through the use of attachment hardware installed as an item of original equipment by the vehicle manufacturer, shall have, at the manufacturer's option, either anchorages for a Type 1 seat belt assembly installed at that position or a Type 1 or Type 2 seat belt assembly installed at that position. If a manufacturer elects to install anchorages for a Type 1 seat belt assembly to comply with this requirement, those anchorages shall consist of, at a minimum, holes threaded to accept bolts that comply with S4.1(f) of Standard No. 209 (49 CFR 571.209).

(b) The requirement in S4.1.1 of this standard that seat belt anchorages for a Type 2 seat belt assembly shall be installed for each forward-facing outboard designated seating position in passenger cars does not apply to any such seating positions that are equipped with an automatic or dynamically tested manual seat belt assembly that meets the frontal crash protection requirements of S5.1 of Standard No. 208 (49 CFR 571.208).

2. S4.2 of Standard No. 210 is amended by revising S4.2.1, S4.2.2, and S4.2.4 to read as follows:

S4.2 *Strength.*

S4.2.1 Except for side-facing seats, the anchorages, attachment hardware, and attachment bolts for any of the following seat belt assemblies shall withstand a 5,000-pound force when tested in accordance with S5.1 of this standard:

(a) Type 1 seat belt assembly;

(b) Lap belt portion of either a Type 2 or automatic seat belt assembly, if such seat belt assembly is voluntarily installed at a seating position; and

(c) Lap belt portion of either a Type 2 or automatic seat belt assembly, if such seat belt assembly is equipped with a detachable upper torso belt.

S4.2.2 The anchorages, attachment hardware, and attachment bolts for all Type 2 and automatic seat belt assemblies that are installed to comply with Standard No. 208 (49 CFR 571.208) shall withstand 3,000-pound forces when tested in accordance with S5.2.

* * *

S4.2.4 The anchorages for all designated seating positions that face in the same direction and are common to the same occupant seat shall be tested by simultaneously loading those anchorages in accor-

dance with the applicable procedures set forth in S5 of this standard.

3. S4.3 of Standard No. 210 is amended by revising S4.3.1.1, S4.3.1.2, S4.3.1.3, and S4.3.2, to read as follows:

S4.3 *Location.* * * *

S4.3.1 *Seat belt anchorages for Type 1 seat belt assemblies and the pelvic portion of Type 2 seat belt assemblies.*

S4.3.1.1 In an installation in which the seat belt does not bear upon the seat frame:

(a) If the seat is a nonadjustable seat, then a line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

(b) If the seat is an adjustable seat, then a line from a point 2.50 inches forward of and 0.375 inches above the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

S4.3.1.2 In an installation in which the belt bears upon the seat frame, the seat belt anchorage, if not on the seat structure, shall be aft of the rearmost belt contact point on the seat frame with the seat in the rearmost position. The line from the seating reference point to the nearest belt contact point on the seat frame, with the seat positioned at the seating reference point, shall extend forward from that contact point at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

S4.3.1.3 In an installation in which the seat belt anchorage is on the seat structure, the line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from that contact point at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

* * * * *

S4.3.2 *Seat belt anchorages for the upper torso portion of Type 2 seat belt assemblies.* Adjust the seat to its full rearward and downward position and adjust the seat back to its most upright position. With the seat and seat back so positioned, the seat belt anchorage for the upper end of the upper torso restraint shall be located within the acceptable range shown in Figure 1, with reference to a two-dimensional drafting template described in SAE Recommended Practice J826 (May 1987). The template's "H" point shall be at the design "H" point of the seat for its full rearward and full downward position, as defined in SAE Recommended Practice J1100 (June 1984), and the template's torso line shall be at the same angle from the vertical as the seat back.

4. S5 of Standard No. 210 is revised to read as follows:

S5 *Test procedures.* Each vehicle shall meet the requirements of S4.2 of this standard when tested according to the following procedures. Where a range of values is specified, the vehicle shall be able to meet the requirements at all points within the range. For the testing specified in these procedures, the attachment hardware (including the retractors and "D" rings) and the attachment bolts from the seat belt assembly installed at a seating position shall be used to attach to the anchorage being tested material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position. The geometry of the attachment shall duplicate the geometry of the attachment of the originally installed seat belt assembly.

S5.1 *Seats with Type 1 or Type 2 seat belt anchorages.* With the seat in its rearmost position, apply a force of 5,000 pounds in the direction in which the seat faces to a pelvic body block as described in Figure 2A, restrained by a material whose breaking strength is is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position, which material is installed so as to duplicate the geometry of any of the seat belt assemblies identified in S4.2.1 of this standard that are installed as original equipment at any designated seating positions on the seat, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. Apply the force at the onset rate of not more than 50,000 pounds per second. Attain the 5,000 pound force in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard.

S5.2 *Seats with Type 2 or automatic seat belt anchorages.* With the seat in its rearmost position, apply a force of 3,000 pounds in the direction in which the seat faces simultaneously to a pelvic body block, as described in Figure 2A, restrained by a material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position, which material is installed so as to duplicate the geometry of any of

the seat belt assemblies identified in S4.2.2 of this standard that are installed as original equipment at any designated seating positions on the seat, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. Apply the forces at the onset rate of not more than 30,000 pounds per second. Attain the 3,000 pound forces in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard at the onset rate of not more than 30,000 pounds per second. Attain the 3,000 pound forces in not more than 30 seconds and maintain them for 10 seconds.

5. The figures in Standard No. 210 are amended by revising Figure 1, redesignating Figure 2 as Figure 2A, and adding a new Figure 2B, to appear as follows:

Issued on April 18, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 17970
April 30, 1990

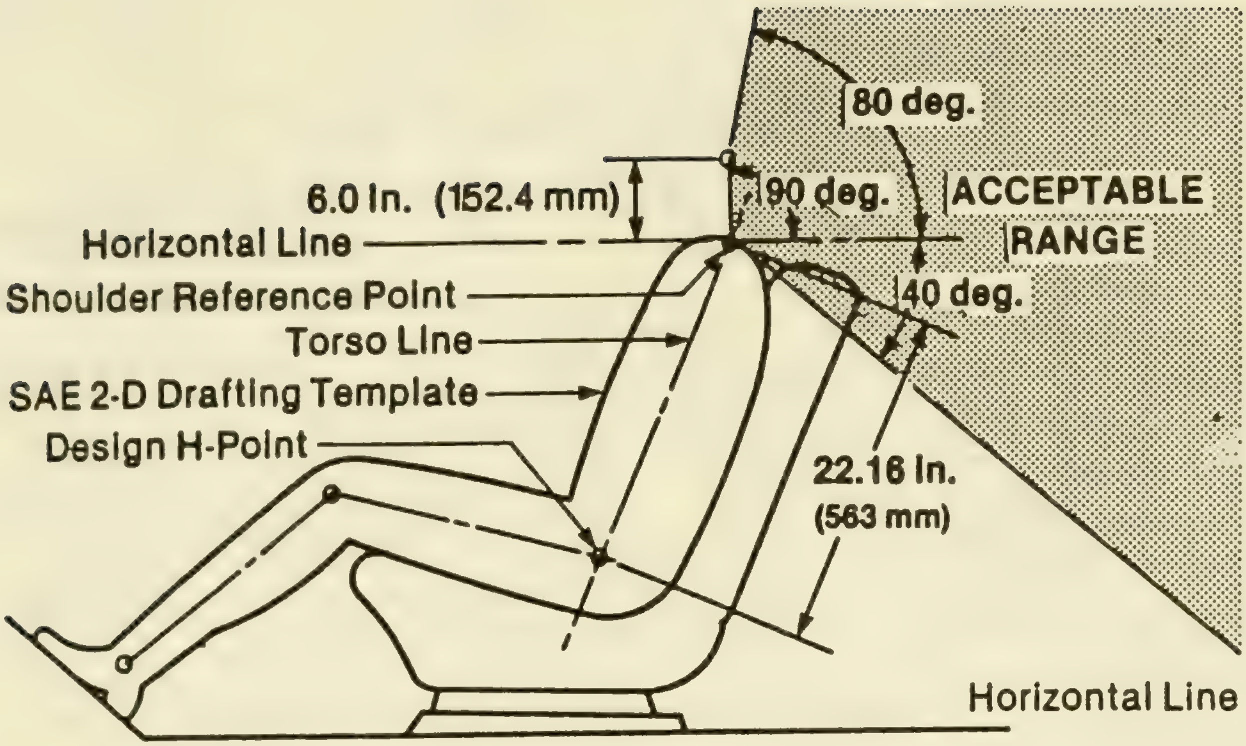


FIGURE 1 - LOCATION OF ANCHORAGE FOR UPPER TORSO RESTRAINT

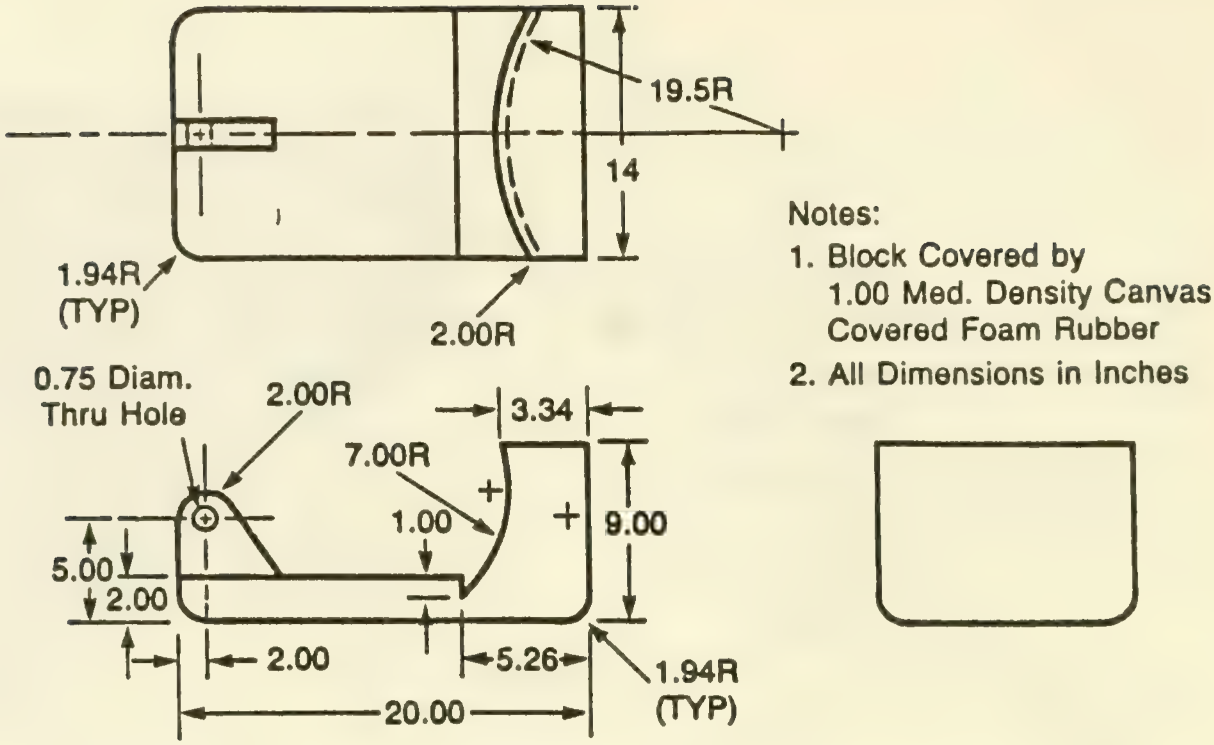


Figure 2A Body Block for Lap Belt Anchorage

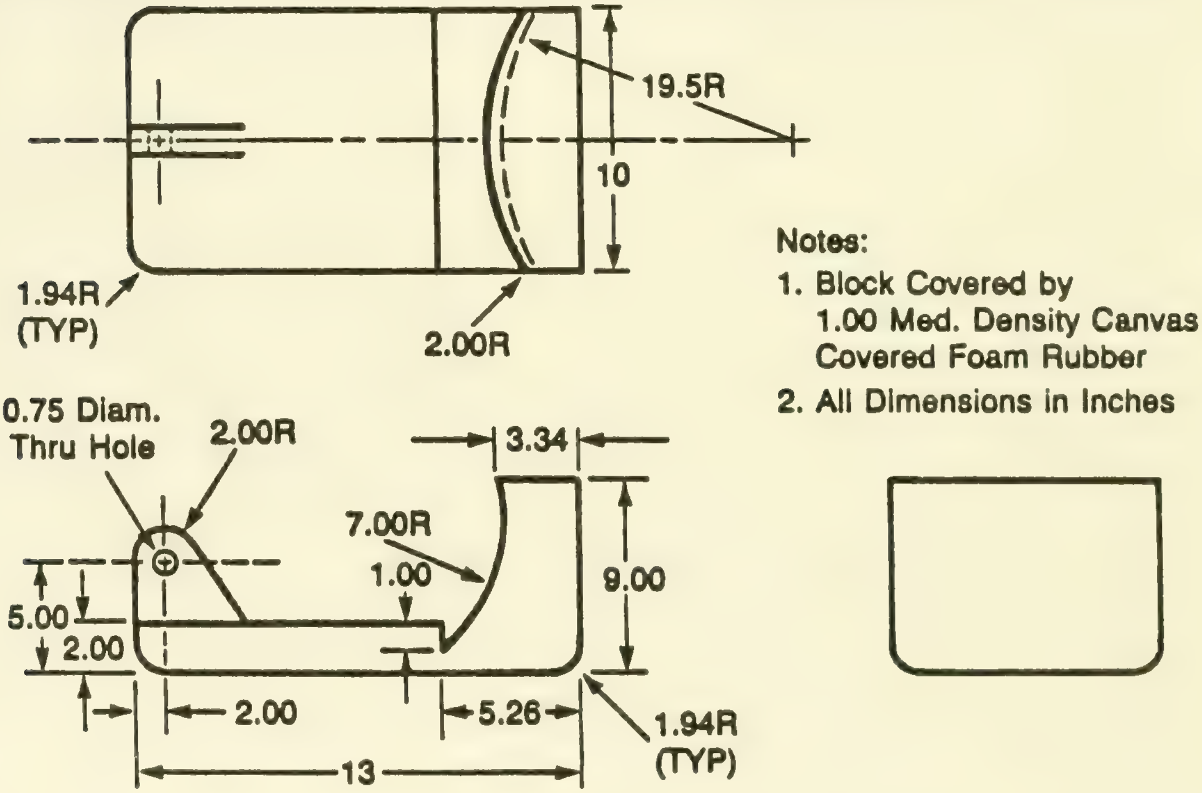


Figure 2B Optional Body Block for Center Seating Positions

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 210

Seat Belt Assembly Anchorages (Docket No. 87-02; Notice 3)

ACTION: Final rule; technical amendment.

SUMMARY: NHTSA recently published a final rule that, among other things, clarified the test procedures used to determine if seats with manual lap/shoulder safety belts or automatic safety belts comply with the anchorage strength requirements. This rule was intended to make clear that the anchorages for these safety belts are tested by simultaneously applying 3,000 pound forces to the upper torso belt and lap belt portions, using specified body blocks to apply this load, instead of by simultaneously applying a 3,000 pound force to the upper torso belt portion and a 5,000 pound force to the lap belt portion. However, NHTSA inadvertently omitted the requirements for the upper torso belt anchorages from this final rule. This notice adds language to correct this oversight.

DATES: The amendment made by this notice takes effect on September 1, 1992. This is the date on which the erroneous language in the April 30, 1990 final rule would have become effective.

SUPPLEMENTARY INFORMATION: On April 30, 1990 (55 FR 17970), NHTSA published a final rule amending Standard No. 210, *Seat Belt Assembly Anchorages* (49 CFR §571.210). Among other things, that rule clarified that the anchorages for manual lap/shoulder safety belts and automatic safety belts are tested for compliance with the anchorage strength requirements by simultaneously applying 3,000 pound forces to the upper torso and lap belt portions of the safety belt, instead of by simultaneously applying a 3,000 pound force to the upper torso belt portion and a 5,000 pound force to the lap belt portion. However, the final rule inadvertently omitted the requirement for applying the 3,000 pound force to the upper torso belt portion of the safety belt. This notice corrects that oversight.

It was clear that this omission was an oversight, because the agency proposed to apply 3,000 pound forces simultaneously to the upper torso belt portion and the lap belt portion of the safety belt and nothing in the preamble to the final rule indicated an agency intention to exempt anchorages for the upper torso belt portions of safety belts from the anchorage strength requirements. Moreover, no commenter suggested that it would be appropriate to exempt upper torso belt anchorages for manual lap/shoulder belts from the anchorage strength requirements. Hence, the agency finds for good cause that notice and opportunity for comment on this correction are unnecessary. The agency also finds that this correction should become effective on September 1, 1992, the date on which the other requirements in the April 30, 1990 final rule will become effective.

In consideration of the foregoing, 49 CFR §571.210 is amended as follows:

S5.2 of Standard No. 210 is revised to read as follows:

* * * * *

S5.2 *Seats with Type 2 or automatic seat belt anchorages.* With the seat in its rearmost position, apply forces of 3,000 pounds in the direction in which the seat faces simultaneously to a pelvic body block, as described in Figure 2A, and an upper torso body block, as described in Figure 3, restrained by a material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position, which material is installed so as to duplicate the geometry of any of the seat belt assemblies identified in S4.2.2 of this standard that are installed as original equipment at any designated seating positions on the seat, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees more than 15 degrees above the horizontal. Apply the forces at the onset rate of not more than 30,000 pounds per second. Attain the 3,000 pound forces in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to

the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard.

* * * * *

Issued on June 12, 1990.

Jeffrey R. Miller
Deputy Administrator

55 FR 24240
June 15, 1990

MOTOR VEHICLE SAFETY STANDARD NO. 210
Seat Belt Assembly Anchorages—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses
(Docket No. 2-14; Notice No. 4)

S1. Purpose and scope. This standard establishes requirements for seat belt assembly anchorages to insure their proper location for effective occupant restraint and to reduce the likelihood of their failure.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

S3. Definition. "Seat belt anchorage" means the provision for transferring seat belt assembly loads to the vehicle structure.

S4. Requirements.

S4.1 Type.

S4.1.1 Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each foward-facing outboard designated seating position in passenger cars, other than convertibles, and for each designated seating position for which a Type 2 seat belt assembly is required by Standard No. 208 (49 CFR 571.208) in vehicles other than passenger cars. Seat belt anchorages for a Type 2 seat belt assembly shall be installed for each rear forward-facing outboard designated seating position in convertible passenger cars manufactured on or after September 1, 1991.

S4.1.2 Seat belt anchorages for a Type 1 or a Type 2 seat belt assembly shall be installed for each designated seating position, except a passenger seat in a bus or a designated seating position for which seat belt anchorages for a Type 2 seat belt assembly are required by S4.1.1.

S4.1.3 [(a) Notwithstanding the requirement of S4.1.1, each vehicle manufactured on or after September 1, 1987, that is equipped with an automatic restraint at the front right outboard designated seating position, which automatic restraint cannot be used for securing a child restraint system solely through the use of attachment hardware installed as an item of original equipment by the vehicle manufacturer shall have, at the manufacturer's option, either anchorages for a Type 1 seat belt assembly installed at that position or a Type 1 or Type 2 seat belt assembly installed at the position. If a manufacturer elects to install anchorages for a Type 1 seat belt assembly to comply with this requirement, those anchorages shall consist of, at a minimum, holes threaded to accept bolts complying with S4.1(f) of Standard No. 209 (49 CFR 571.209).

(b) The requirement in S4.1.1 of this standard that seat belt anchorages for a Type 2 seat belt assembly shall be installed for each forward-facing outboard designated seating position in passenger cars does not apply to any such seating positions that are equipped with an automatic or dynamically tested manual seat belt assembly that meets the frontal crash protection requirements of S5.1 of Standard No. 208 (49 CFR 571.208). **(55 F.R. 17970—April 30, 1990. Effective: April 30, 1991)]**

S4.2 Strength.

S4.2.1 [Except for side-facing seats, the anchorages, attachment hardware, and attachment bolts for any of the following seat belt assemblies shall withstand a 5,000-pound force when tested in accordance with S5.1 of this standard:

(a) Type 1 seat belt assembly;

(b) Lap belt portion of either a Type 2 or automatic seat belt assembly, if such seat belt assembly is voluntarily installed at a seating position; and

(c) Lap belt portion of either a Type 2 or automatic seat belt assembly, if such seat belt assembly is equipped with a detachable upper torso belt. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S4.2.2 [The anchorages, attachment hardware, and attachment bolts for all Type 2 and automatic seat belt assemblies that are installed to comply with Standard No. 208 (49 CFR 571.208) shall withstand 3,000-pound forces when tested in accordance with S5.2. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S4.2.3 Permanent deformation or rupture of a seat belt anchorage or its surrounding area is not considered to be a failure, if the required force is sustained for the specified time.

S4.2.4 [The anchorages for all designated seating positions that face in the same direction and are common to the same occupant seat shall be tested by simultaneously loading those anchorages in accordance with the applicable procedures set forth in S5 of this standard. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S4.3 Location. As used in this section, "forward" means in the direction in which the seat faces, and other directional references are to be interpreted accordingly. Anchorages for automatic seat belt assemblies and for dynamically tested seat belt assemblies that meet the frontal crash protection requirements of S5.1 of Standard No. 208 (49 CFR Part 571.208) are exempt from the location requirements of this section. Anchorages are exempt from the requirements of S4.3.2 of this standard, if those anchorages are for the upper torso portion of a Type 2 seat belt assembly installed at a forward-facing rear outboard seating position of a passenger car, other than a convertible, that is manufactured on or after December 11, 1989 and before September 1, 1990.

S4.3.1 [Seat belt anchorages for Type 1 seat belt assemblies and the pelvic portion of Type 2 seat belt assemblies. (55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]

S4.3.1.1 [In an installation in which the seat belt does not bear upon the seat frame:

(a) If the seat is a nonadjustable seat, then a line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees.

(b) If the seat is an adjustable seat, then a line from a point 2.50 inches forward of and 0.375 inch above the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from the anchorage at an angle with the horizontal of not less than 30 degrees and not more than 75 degrees. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S4.3.1.2 [In an installation in which the belt bears upon the seat frame, the seat belt anchorage, if not on the seat structure, shall be aft of the rearmost belt contact point on the seat frame with the seat in the rearmost position. The line from the seating reference point to the nearest belt contact point on the seat frame, with the seat positioned at the seating reference point, shall extend forward from that contact point at an angle with the horizontal of not less than 30° and not more than 75°. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S4.3.1.3 [In an installation in which the seat belt anchorage is on the seat structure, the line from the seating reference point to the nearest contact point of the belt with the hardware attaching it to the anchorage shall extend forward from that contact point at an angle with the horizontal of not less than 30° and not more than 75°. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S4.3.1.4 Anchorages for an individual seat belt assembly shall be located at least 6.50 inches apart laterally, measured between the vertical centerlines of the bolt holes.

S4.3.2 Seat belt anchorages for the upper torso portion of Type 2 seat belt assemblies. [Adjust the seat to its full rearward and downward position and adjust the seat back to its most upright position. With the seat and seat back so positioned, the seat belt anchorage for the upper end of the upper torso restraint shall be located within the acceptable range shown in Figure 1, with reference to a two-dimensional drafting template described in

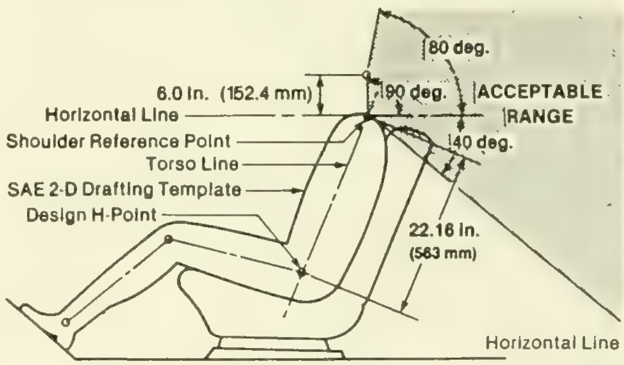


FIGURE 1—LOCATION OF ANCHORAGE FOR UPPER TORSO RESTRAINT

SAE Recommended Practice J826 (May 1987). The template's "H" point shall be at the design "H" point of the seat for its full rearward and full downward position, as defined in SAE Recommended Practice J1100 (June 1984), and the template's torso line shall be at the same angle from the vertical as the seat back. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S5. Test procedures. [Each vehicle shall meet the requirements of S4.2 of this standard when tested according to the following procedures. Where a range of values is specified, the vehicle shall be able to meet the requirements at all points within the range. For the testing specified in these procedures, the attachment hardware (including the retractors and "D" rings) and the attachment bolts from the seat belt assembly installed at a seating position shall be used to attach to the anchorage being tested material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position. The geometry of the attachment shall duplicate the geometry of the attachment of the originally installed seat belt assembly. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

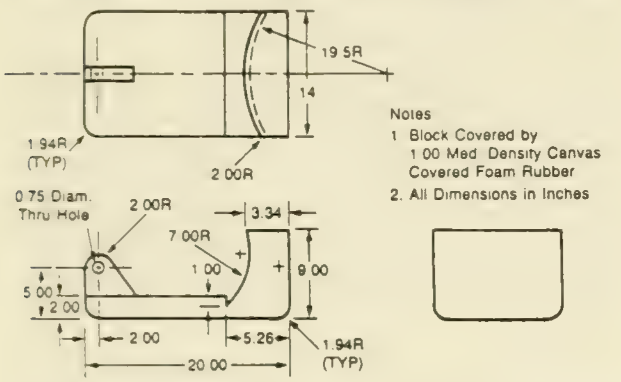


FIGURE 2A—BODY BLOCK FOR LAP BELT ANCHORAGE

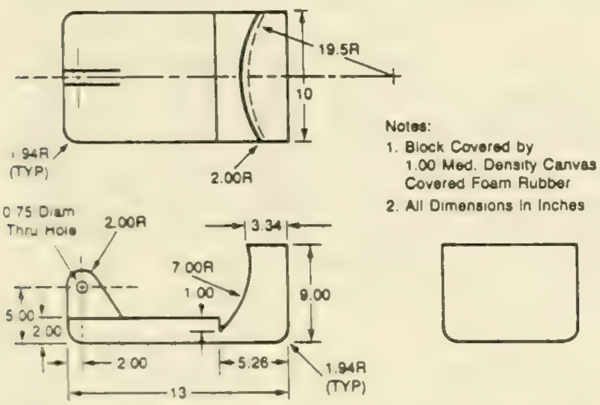


FIGURE 2B—OPTIONAL BODY BLOCK FOR CENTER SEATING POSITIONS

S5.1 Seats with Type 1 or Type 2 seat belt anchorages. [With the seat in its rearmost position, apply a force of 5,000 pounds in the direction in which the seat faces to a pelvic body block as described in Figure 2A, restrained by a material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position, which material is installed so as to duplicate the geometry of any of the seat belt assemblies identified in S4.2.1 of this standard that are installed as original equipment at any designated seating positions on the seat, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5 degrees nor more than 15 degrees above the horizontal. Apply the force at the onset rate of not more than 50,000 pounds per second. Attain the 5,000 pound force in not more than 30 seconds and maintain it for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard. **(55 F.R. 17970—April 30, 1990. Effective: September 1, 1992)]**

S5.2 [Seats with Type 2 seat belt anchorages. With the seat in its rearmost position, apply forces of 3,000 pounds in the direction in which the seat faces simultaneously to a pelvic body block, as described in Figures 2A, and an upper torso body block, as described in Figure 3B, restrained by a material whose breaking strength is equal to or greater than the breaking strength of the webbing for the seat belt assembly installed as original equipment at that seating position, which belt assemblies identified in S4.2.2 of this standard that are installed as original equipment at any designated seating positions on the seat, in a plane parallel to the longitudinal centerline of the vehicle, with an initial force application angle of not less than 5° more than 15° above the horizontal. Apply the forces at the onset rate of not more than 30,000 pounds per second. Attain the 3,000-pound forces in not more than 30 seconds and maintain them for 10 seconds. At the manufacturer's option, the pelvic body block described in Figure 2B may be substituted for the pelvic body block described in Figure 2A to apply the specified

force to the center set(s) of anchorages for any group of three or more sets of anchorages that are simultaneously loaded in accordance with S4.2.4 of this standard. **(55 F.R. 24240—June 15, 1990. Effective: September 1, 1991)]**

S6. Owner's Manual Information. The owner's manual in each vehicle with GVWR of 10,000 pounds or less, manufactured after September 1, 1987, shall include:

(a) A section explaining that all child restraint systems are designed to be secured in vehicle seats by lap belts or the lap belt portion of a lap-shoulder belt. The section shall also explain that children could be endangered in a crash if their child restraints are not properly secured in the vehicle.

(b) In a vehicle with rear designated seating positions, a statement alerting vehicle owners that, according to accident statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.

(c) In each passenger car, a diagram or diagrams showing the location of the shoulder belt anchorages required by this standard for the rear outboard designated seating positions, if shoulder belts are not installed as items of original equipment by the vehicle manufacturer at those positions.

S7. Installation Instructions. The owner's manual in each vehicle manufactured on or after September 1, 1987, with an automatic restraint at the front right outboard designated seating position that cannot be used to secure a child restraint system when the automatic restraint is adjusted to meet the performance requirements of S5.1 of Standard No. 208 shall have:

(a) A statement that the automatic restraint at the front right outboard designated seating position cannot be used to secure a child restraint and, as appropriate, one of the following three statements:

(1) A statement that the automatic restraint at the front right outboard designated seating position can be adjusted to secure a child restraint system using attachment hardware installed as original equipment by the vehicle manufacturer;

(2) A statement that anchorages for installation of a lap belt to secure a child restraint system have been provided at the front right outboard designated seating position; or

(3) A statement that a lap or manual lap or lap/shoulder belt has been installed by the vehicle manufacturer at the front right outboard designated seating position to secure a child restraint.

(b) In each vehicle in which a lap or lap/shoulder belt is not installed at the front right outboard designated seating position as an item of original equipment, but the automatic restraint at that position can be adjusted by the vehicle owner to secure a child restraint system using an item or items of original equipment installed in the vehicle by the vehicle manufacturer, the owner's manual shall also have:

(1) A diagram or diagrams showing the location of the attachment hardware provided by the vehicle manufacturer.

(2) A step-by-step procedure with a diagram or diagrams showing how to modify the automatic restraint system to secure a child restraint system. The instructions shall explain the proper routing of the attachment hardware.

(c) In each vehicle in which the automatic restraint at the front right outboard designated seating position cannot be modified to secure a child restraint system using attachment hardware installed as an original equipment by the vehicle manufacturer and a manual lap or lap/shoulder belt is not installed as an item of original equipment by the vehicle manufacturer, the owner's manual shall also have:

(1) A diagram or diagrams showing the locations of the lap belt anchorages for the front right outboard designated seating position.

(2) A step-by-step procedure and a diagram or diagrams for installing the proper lap belt anchorage hardware and a Type 1 lap belt at the front right outboard designated seating position. The instructions shall explain the proper routing of the seat belt assembly and the seat belt attachment of the assembly to the lap belt anchorages.

Issued on August 12, 1986

51 F.R. 29552
August 19, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 213 and PART 572

Anthropomorphic Test Dummies—3-Year-Old Child (Docket No. 89-13; Notice 2) RIN 2127-AB94

ACTION: Final rule.

SUMMARY: This notice amends NHTSA's specifications for the 3-year-old-child test dummy NHTSA uses to test child restraint systems. Specifications are provided for a new head which has a higher natural frequency response, and is therefore better suited for compliance testing than the present head assembly. In addition, generic specifications are set for two different types of accelerometers which may be used with the dummy.

DATES: The effective date for making these amendments to the CFR is August 27, 1990.

Until September 1, 1993, each 3-year-old-child test dummy NHTSA uses to test an add-on child restraint will incorporate, at the manufacturer's option, either the new head assembly specified in §572.16(a)(1) or the old head assembly specified in §572.16(a)(2).

Effective September 1, 1993, each 3-year-old-child dummy NHTSA uses to test an add-on child restraint will incorporate the new head assembly specified in §572.16(a)(1).

Beginning August 27, 1990, each 3-year-old-child dummy NHTSA uses to test a built-in child restraint incorporates the new head assembly specified in §572.16(a)(1).

SUPPLEMENTARY INFORMATION:

Background. On July 11, 1989, NHTSA published a notice of proposed rulemaking (NPRM) concerning changes to the agency's specifications for the 3-year-old-child test dummy (54 FR 29071).

First, the agency proposed a new head assembly for the test dummy. The agency also proposed that, if the new specifications were adopted, dummies conforming to them would be used by the agency when evaluating both add-on and built-in restraints. (A built-in child restraint is one that is an integral part of a vehicle.)

This proposal was developed following the implementation on January 22, 1988 of amendments to Standard No. 213 establishing performance and test criteria expressly applicable to built-in restraint systems. Prior to that date, Standard 213 specified performance and test criteria suitable for add-on child restraint systems only. (An add-on restraint is any portable child restraint system.) In tests of add-on systems, the test environment is a standard vehicle seat assembly to which the restraint is attached by a lap belt. During testing, the dummy's head does not contact a rigid surface which is not part of the child restraint system.

During compliance testing of built-in restraint systems, the dummy's head may contact a rigid surface, because the performance of the built-in restraint in protecting the child is determined by testing the restraint in proximity to other parts of the vehicle interior, which may include rigid surfaces. The current head of the 3-year-old-child dummy has a relatively low natural frequency response, which may cause it to give unreliable data when the head contacts a rigid surface. The agency believed there was an apparent need to adopt a head that has a natural frequency response (the frequency of a free vibration at which an elastic system starts to vibrate when impacted by a force) appropriate for measuring acceleration resulting from impact between the dummy head and rigid surfaces. (Issues relating to the reliability and validity of the new head as a test device were thoroughly discussed in the NPRM and will not be repeated here.)

Second, the agency proposed two different types of generically designated accelerometers based on frequency response characteristics and location specifications within the dummy. Any accelerometer system conforming with these specifications could be used with the dummy. NHTSA proposed the generic accelerometer specifications because manufacture of the particular accelerometer model specified in Part 572 has been discontinued, and because NHTSA tentatively concluded there was no necessity to specify another particular model for use in compliance testing. Any accelerometer that meets the proposed specifications, and is positioned in the test dummy at the specified reference points so that the seismic masses of each sensing element would be

aligned with the head and thoracic reference points, would give the same measurements as any other accelerometer with the equivalent impact response characteristics and positioning. NHTSA believed that generic accelerometer specifications would avoid difficulties associated with a particular accelerometer model when the manufacture of that model is discontinued.

Comments on the NPRM

New head design

NHTSA received six comments on the proposed changes. The University of Michigan (UM) strongly urged that the agency adopt the new head. The University said that UM has been using the new head in child restraint tests since the early 1980's, and because of the existing head's low natural frequency, would not consider returning to the use of the old design. Volvo Cars of North America also supported the proposed change to the new head, stating that "the change of material in the dummy head will avoid some of the interfering noise occurring in the old dummy head due to its low material frequency."

General Motors Corporation (GM) submitted initial and supplemental comments on the NPRM. In its initial comment, GM said it had yet to test the proposed dummy head, but expressed concern that "the 3-year-old-child dummy, with or without the new head, still lacks a reasonable level of impact response biofidelity." (GM's comment reflects the fact that, after NHTSA established specifications for the 3-year-old-child test dummy in 1979, GM petitioned the agency to reconsider whether the specified dummy was an appropriate test device. NHTSA analyzed GM's concerns about the dummy and found them to be without merit. Accordingly, the agency denied the petition (45 FR 82265; December 15, 1980).) GM did not provide any data or information in its initial comment to the NPRM that convincingly established that NHTSA should refrain from using the 3-year-old-child test dummy to test child restraint systems. In its supplemental comment, GM stated that it tested the proposed head assembly and found that head accelerations met the proposed calibration levels when a light coat of a silicone lubricant was applied between the head skin and skull prior to the test. Applying a lubricant is recognized by the Society of Automotive Engineers (SAE) as an acceptable practice and is used by the industry to bring other Part 572 test dummies into calibration specifications. GM stated that it agreed with the proposed specification and use of the new head assembly on the 3-year-old-child test dummy.

Ford supported the agency's objective of improving the testing capability of the 3-year-old-child dummy, but was concerned that the natural frequency of the proposed fiberglass head "still may have too low a natural frequency to eliminate ringing." Ford seemed to believe that the new head has a natural frequency "just above 1000 Hz," which would cause mechanical ringing of the head at or near that frequency in certain impacts. The commenter suggested that NHTSA consider developing a new dummy head with a structure of aluminum or magnesium, "to provide a natural frequency well above 1000 Hz."

Ford apparently was not aware that the natural frequency of the new head is 3,300 Hz, which is 3.3 times higher than the nominal class 1,000 filter cut-off frequency referenced in §572.21 and specified by the SAE for head impact response measurements ("Performance Measurements of Three-Year-Old-Child Test Dummy Heads, December 1983; Report No. DOT HS 806-742). That natural frequency is considerably higher than that of the current head (400 Hz). Because the adequacy of the new head has been established by NHTSA testing, and because no information has arisen showing problems with the new head, the agency believes the new dummy head is completely suitable for use in the 3-year-old child dummy.

The NPRM proposed that NHTSA would continue testing add-on restraints with the present dummy head or the new head, at the manufacturer's option, for 3 years. The NPRM proposed that, after the 3-year period, NHTSA would test all add-on child restraints with dummies incorporating the new head assembly. The agency explained in the NPRM that it sought to have, eventually, only one head assembly for the 3-year-old-child dummy, to preclude inadvertent use of the current head assembly in a compliance test of a built-in restraint.

Ford requested that the agency permit indefinite use of the present dummy head, rather than limit such use to a 3-year period. Ford said that there is little risk that the wrong head would be mistakenly used, particularly if the new head is composed of aluminum or magnesium, materials unlike in appearance to the current (urethane) dummy head.

NHTSA disagrees with Ford that the agency's compliance procedures should permit the indefinite use of the present dummy head. Since the new head will be composed from fiberglass (and not the aluminum and magnesium materials Ford suggested) and is outwardly identical to the current head assembly, it is important that the agency reduce the likelihood that the present head could be inadvertently used in a compliance test of a built-in restraint system. Such errors would represent a needless waste of time and resources. With respect to add-on restraints, those that pass a Standard 213 compliance test when tested with a dummy incorporating the existing

head should also pass when tested with a dummy using the new head. Thus, there is no apparent advantage to retaining the old head beyond the 3-year period. Further, test dummy heads, on average, must be replaced after approximately 3 years due to the wear from testing and the aging of the rubbers and plastics in the head. Thus, the 3-year transition period before use of the new head assembly is mandated should not impose any burdens on the dummy users. Testing facilities could continue using the current head assemblies during the 3-year transition period and could purchase the new head assemblies when the current head assemblies must be replaced.

Ford and GM highlighted sections of the proposed regulatory language where typographical or editorial corrections were appropriate. NHTSA has adopted these suggestions. In addition, Ford asked the agency to make it clear that, during the 3-year period when optional use of either head is permitted, NHTSA's compliance testing would be conducted using the type of dummy head that the add-on child restraint manufacturer chose to use in certifying its restraint system. NHTSA does not object to using the same type of head, and has revised the text of S7.2 of Standard 213 to specify that the type of head used in compliance tests during the 3-year period is at the manufacturer's option.

Proposed specifications for the accelerometer

All comments relating to the proposed adoption of generic specifications for the accelerometer were supportive of the proposal. Ford suggested minor changes to the regulatory language to clarify specifications or correct typographical errors. The agency agrees with these recommendations, and has adopted the generic specifications proposed in the NPRM, as revised by Ford's suggested changes.

Effective date

The effective date for making these amendments to the CFR is 30 days from the date of publication.

Beginning 30 days after publication of the final rule, each 3-year-old-child test dummy NHTSA uses to test a built-in child restraint will be assembled with the new head assembly specified in §572.16(a)(1). The higher natural frequency response of the new head assembly will ensure that the head acceleration measurements taken during testing of built-in child restraints are accurate and reliable. Because of the need for accurate and reliable head acceleration measurements, the agency finds that this effective date of less than 180 days is in the public interest.

For add-on restraints, the NPRM proposed that manufacturers would have the option of specifying the use of the current or new head assembly in NHTSA compliance testing, beginning 30 days after publication of the final rule, "until three years after publication of a final rule." Permitting optional use of the proposed head assembly beginning 30 days after publication will not impose any burdens on any party, and will further the public interest by allowing manufacturers to gain experience with the new head assembly. Thus, NHTSA again finds good cause for such an effective date.

Although the NPRM did not identify the exact date 3 years after publication of a final rule from which use of the present head assembly in NHTSA's compliance tests will cease, such a date must be specified in Standard 213 so that all persons reading the standard can readily know how NHTSA conducts its testing. This final rule specifies this date as September 1, 1993. The agency has determined that this date is appropriate because it is approximately 3 years after the date of anticipated issuance of this final rule, and consistent with the date the NPRM proposed.

In consideration of the foregoing, NHTSA amends 49 CFR Parts 571 and 572 as follows:

S7.2 of §571.213 is revised to read as follows:

S7.2 *Three-year-old-child dummy.* A three-year-old-child dummy conforming to Subpart C of Part 572 of this chapter is used for testing a child restraint that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing more than 20 pounds.

(a) *Built-in child restraints.* When a three-year-old-child test dummy is used for testing a built-in child restraint, the dummy shall be assembled with the head assembly specified in §572.16(a)(1).

(b) *Add-on child restraints.* Until September 1, 1993, when a three-year-old-child test dummy is used for testing an add-on child restraint, the dummy shall be assembled using, at the manufacturer's option, either head assembly specified in §572.16(a).

Effective September 1, 1993, when a three-year-old-child dummy is used for testing an add-on child restraint, the dummy shall be assembled with the head assembly specified in §572.16(a)(1).

* * * * *

PART 572—ANTHROPOMORPHIC TEST DUMMIES

1. The authority citation for Part 572 continues to read as follows:

Authority: 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.50.

Subpart C—3-Year-Old Child

2. Paragraphs (a) and (b) of section 572.16 are revised to read as follows:

§572.16 Head.

(a) The head consists of the assembly designated

as SA 103C 010 on drawing no. SA 103C 001, and conforms to either—

(1) each item specified on drawing SA 103C 002(B), sheet 8; or

(2) each item specified on drawing SA 103C 002, sheet 8.

(b) When the head is impacted by a test probe specified in §572.21(a)(1) at 7 fps, then the peak resultant acceleration measured at the location of the accelerometer mounted in the headform according to §572.21(b) is not less than 95g and not more than 118g.

(1) The recorded acceleration-time curve for this test is unimodal at or above the 50g level, and lies at or above that level for intervals:

(i) in the case of the head assembly specified in paragraph (a)(1) of this section, not less than 1.3 milliseconds and not more than 2.0 milliseconds;

(ii) in the case of the head assembly specified in paragraph (a)(2) of this section, not less than 2.0 milliseconds and not more than 3.0 milliseconds.

(2) The lateral acceleration vector does not exceed 7g.

* * * * *

Section 572.17(a) is revised to read as follows:

§572.17 Neck.

(a)(1) The neck for use with the head assembly described in §572.16(a)(1) consists of the assembly designated as SA 103C 020 on drawing No. SA 103C 001, and conforms to each item specified on drawing No. SA 103C 002(B), sheet 9.

(2) The neck for use with the head assembly described in §572.16(a)(2) consists of the assembly designated as SA 103C 020 on drawing No. SA 103C 001, and conforms to each item specified on drawing No. SA 103C 002, sheet 9.

* * * * *

Section 572.21 is amended by revising paragraphs (a), (b), and (c) to read as follows:

§572.21 Test conditions and instrumentation.

(a)(1) The test probe used for head and thoracic impact tests is a cylinder 3 inches in diameter, 13.8 inches long, and weighing 10 lbs., 6 ozs. Its impacting end has a flat right face that is rigid and that has an edge radius of 0.5 inches.

(2) The head and thorax assembly may be instrumented with a Type A or Type C accelerometer.

(i) Type A accelerometer is defined in drawing SA–572 S1.

(ii) Type C accelerometer is defined in drawing SA–572 S2.

(b) *Head Accelerometers.* Install one of the triaxial accelerometers specified in §572.21(a)(2) on a mounting block located on the horizontal transverse bulkhead as shown in the drawings subreferenced under assembly SA 103C 010 so that the seismic mass centers of each sensing element are positioned as specified in this paragraph, relative to the head accelerometer reference point located at the intersection of a line connecting the longitudinal centerlines of the transfer pins in the side of the dummy head with the midsagittal plane of the dummy head.

(1) The sensing elements of the Type C triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and coincident with the midsagittal plane, with the seismic mass center located 0.2 inches dorsal to, and 0.1 inches inferior to the head accelerometer reference point.

(ii) Align the second sensitive axis with the horizontal plane, perpendicular to the midsagittal plane, with the seismic mass center located 0.1 inches inferior, 0.4 inches to the right of, and 0.9 inches dorsal to the head accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.1 inches inferior to, 0.6 inches dorsal to, and 0.4 inches to the right of the head accelerometer reference point.

(iv) All seismic mass centers are positioned with ±0.05 inches of the specified locations.

(2) The sensing elements of the Type A triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and coincident with midsagittal planes, with the seismic mass center located from 0.2 to 0.47 inches dorsal to, from 0.01 inches inferior to 0.21 inches superior, and from 0.0 to 0.17 inches left of the head accelerometer reference point.

(ii) Align the second sensitive axis with the horizontal plane, perpendicular to the midsagittal plane, with the seismic mass center located 0.1 to 0.13 inches inferior to, 0.17 to 0.4 inches to the right of, and 0.47 to 0.9 inches dorsal of the head accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.1 to 0.13 inches inferior to, 0.6 to 0.81 inches dorsal to, and from 0.17 inches left to 0.4 inches right of the head accelerometer reference point.

(c) *Thorax Accelerometers.* Install one of the triaxial accelerometers specified in §572.21(a)(2) on a mounting plate attached to the vertical transverse bulkhead shown in the drawing subreferenced under assembly No. SA 103C 030 in drawing SA 103C 001, so that the seismic mass centers of each sensing element are positioned as specified in this paragraph, relative to the thorax accelerometer reference

point located in the midsagittal plane 3 inches above the top surface of the lumbar spine, and 0.3 inches dorsal to the accelerometer mounting plate surface.

(1) The sensing elements of the Type C triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and midsagittal planes, with the seismic mass center located 0.2 inches to the left of, 0.1 inches inferior to, and 0.2 inches ventral to the thorax accelerometer reference point.

(ii) Align the second sensitive axis so that it is in the horizontal transverse plane, and perpendicular to the midsagittal plane, with the seismic mass center located 0.2 inches to the right of, 0.1 inches inferior to, and 0.2 inches ventral to the thorax accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.2 inches superior to, 0.5 inches to the right of, and 0.1 inches ventral to the thorax accelerometer reference points.

(iv) All seismic mass centers shall be positioned within ± 0.05 inches of the specified locations.

(2) The sensing elements of the Type A triaxial accelerometer are aligned as follows:

(i) Align one sensitive axis parallel to the vertical bulkhead and midsagittal planes, with the seismic mass center located from 0.2 inches left to 0.28 inches right, from 0.5 to 0.15 inches inferior to, and from 0.15 to 0.25 inches ventral of the thorax accelerometer reference point.

(ii) Align the second sensitive axis so that it is in the horizontal transverse plane and perpendicular to the midsagittal plane, with the seismic mass center located from 0.06 inches left to 0.2 inches right of, from 0.1 inches inferior to 0.24 inches superior, and 0.15 to 0.25 inches ventral to the thorax accelerometer reference point.

(iii) Align the third sensitive axis so that it is parallel to the midsagittal and horizontal planes, with the seismic mass center located 0.15 to 0.25 inches superior to, 0.28 to 0.5 inches to the right of, and from 0.1 inches ventral to 0.19 inches dorsal to the thorax accelerometer reference point.

Issued on July 20, 1990.

Jerry Ralph Curry
Administrator

55 FR 30465
July 26, 1990

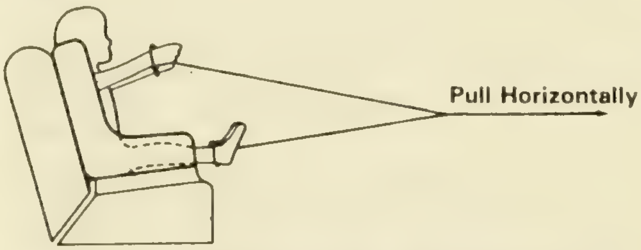
S6.1.2.5 Accelerate the test platform to simulate frontal impact in accordance with S6.1.1.2 (a) or S6.1.1.2. (b), as appropriate.

S6.1.2.6 [For add-on child restraint systems, measure dummy excursion and determine conformance with the requirements specified in S5.1 as appropriate. For built-in child restraint systems, measure dummy knee excursion and determine conformance with the requirements specified in S5.1 as appropriate. **(53 F.R. 1783—January 22, 1988. Effective: January, 22, 1988)**]

S6.2 Buckle release test procedure. The belt assembly buckles used in the child restraint system shall be tested in accordance with S6.2.1 through S6.2.4 inclusive.

S6.2.1 Before conducting the testing specified in S6.1, place the loaded buckle on a hard, flat, horizontal surface. Each belt end of the buckle shall be pre-loaded in the following manner. The anchor end of the buckle shall be loaded with a 2-pound force in the direction away from the buckle. In the case of buckles designed to secure a single latch plate, the belt latch plate end of the buckle shall be pre-loaded with a 2-pound force in the direction away from the buckle. In the case of buckles designed to secure two or more latch plates, the belt latch plate ends of the buckle shall be loaded equally so that the total load is 2 pounds, in the direction away from the buckle. For push-button release buckles the release force shall be applied by a conical surface (cone angle not exceeding 90 degrees). For push-button release mechanisms with a fixed edge (referred to in Figure 7 as "hinged button"), the release force shall be applied at the centerline of the button, 0.125 inches away from the movable edge directly opposite the fixed edge, and in the direction that produces maximum releasing effect. For push-button release mechanisms with no fixed edge (referred to Figure 7 as "floating button"), the release force shall be applied at the center of the release mechanism in the direction that produces the maximum releasing effect. For all othe buckle release mechanisms, the force shall be applied on the centerline of the buckle lever or finger tab in the direction that produces the maximum releasing effect. Measure the force required to release the buckle. Figure 7 illustrates the loading for the different buckles and the point where the release force should be applied, and Figure 8 illustrates the conical surface used to apply the release force to push-button release buckles.

S6.2.2 After completion of the testing specified in S6.1, and before the buckle is unlatched, tie a self-adjusting sling to each wrist and ankle of the test dummy in the manner illustrated in Figure 4.



Buckle Release Test

FIGURE 4

S6.2.3 [Pull the sling horizontally in the manner illustrated in Figure 4 and parallel to the center SORL of the seat assembly, in the case of an add-on child restraint system, or parallel to the longitudinal center line of either the specific vehicle shell or the specific vehicle, in the case of a built-in child restraint system, and apply a force of 20 pounds in the case of a system tested with a 6 month-old dummy and 45 pounds in the case of a system tested with a 3 year-old dummy. **(53 F.R. 1783—January 22, 1988. Effective: January, 22, 1988)**]

S6.2.4 While applying the force specified in S6.2.3, and using the device shown in Figure 8 for push-button release buckles, apply the release force in the manner and location specified in S6.2.1 for that type of buckle. Measure the force required to release the buckle.

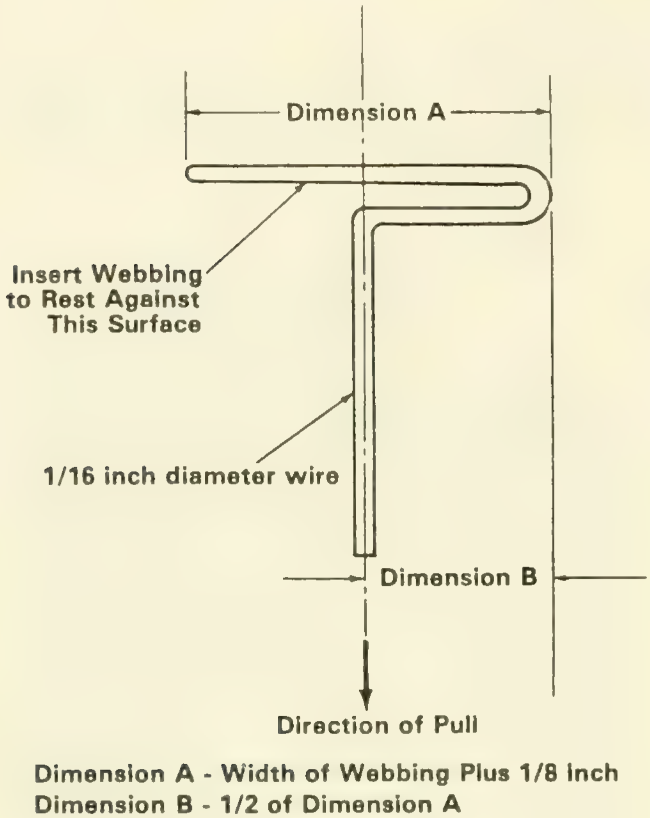
S6.3 Head impact protection—energy absorbing material test procedure.

S6.3.1 Prepare and test specimens of the energy absorbing material used to comply with S5.2.3 in accordance with the applicable 25 percent compression-deflection test described in the American Society for Testing and Materials (ASTM) Standard D1056-73, "Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber", or D1564-71. "Standard Method of Testing Flexible Cellular Materials— Slab Urethane Foam" or D1565-76 "Standard Specification for Flexible Cellular Materials— Vinyl Chloride Polymer and Copolymer open-cell foams.

S7 Test dummies.

S7.1 Six-month-old dummy. An unclothed "Six-month-old Size Manikin" conforming to Subpart D of Part 572 of this chapter is used for

testing a child restraint system that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing not more than 20 pounds.



Webbing Tension Pull Device

FIGURE 5

S7.2 Three-year-old dummy. A three-year-old dummy conforming to Subpart C of Part 572 of this chapter is used for testing a child restraint that is recommended by its manufacturer in accordance with S5.6 for use by children in a weight range that includes children weighing more than 20 pounds.

[(a) *Built-in child restraints.* When a three-year-old test dummy is used for testing a built-in child restraint, the dummy shall be assembled with the head assembly specified in § 572.16(a)(1).

(b) *Add-on child restraints.* Until September 1, 1993, when a three-year-old test dummy is used for testing an add-on child restraint, the dummy shall be assembled using, at the manufacturer's option, either head assembly specified in § 572.16(a).

Effective September 1, 1993, when a three-year-old dummy is used for testing an add-on child restraint, the dummy shall be assembled with the head assembly specified in § 572.16(a)(1). **(55 F.R. 30465—July 26, 1990. Effective: August 27, 1990.]**

S7.2.1 Before being used in testing under this standard, the dummy is conditioned at any ambient temperature from 66° F to 78° F and at any relative humidity from 10 percent to 70 percent for at least 4 hours.

S7.2.2 When used in testing under this standard, the dummy is clothed in thermal knit waffle-weave polyester and cotton underwear, a size 4 long-sleeved shirt weighing 0.2 pounds, a size 4 pair of long pants weighing 0.2 pounds and cut off just far enough above the knee to allow the knee target to be visible, and size 7M sneakers with rubber toe caps, uppers of dacron and cotton or nylon and a total weight of 1 pound. Clothing other than the shoes is machine-washed in 160° F to 180° F water and machine dryed at 120° F to 140° F for 30 minutes.

S7.3 Standard test devices.

(a) The standard test devices used in testing add-on child restraint systems under this standard are:

(1) For testing for motor vehicle use, a standard seat assembly consisting of a simulated vehicle bench seat, with three seating positions, which is described in Drawing Package SAS-100-1000 (consisting of drawings and a bill of materials); and

(2) For testing for aircraft use, a standard seat assembly consisting of a representative aircraft passenger seat.

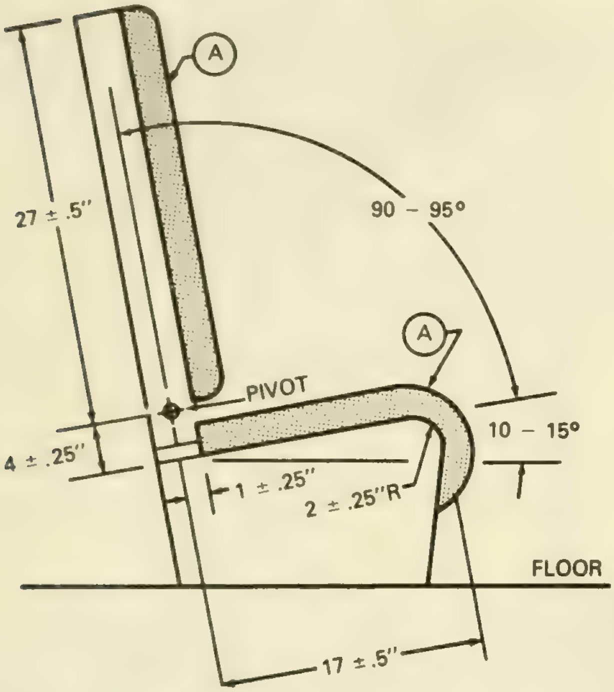
(b) The standard test devices used in testing built-in child restraint systems under this standard are either a specific vehicle shell or a specific vehicle.

S8. Requirements, test conditions, and procedures for child restraint systems manufactured for use in an aircraft. Each child restraint system manufactured for use in both motor vehicles and aircraft must comply with all of the applicable requirements specified in section S5 and with the additional requirement specified in S8.1 and S8.2.

S8.1 Installation instructions. Each child restraint system manufactured for use in aircraft

shall be accompanied by printed instructions in the English language that provide a step-by-step procedure, including diagrams, for installing the system in aircraft passenger seats, securing the system to the seat, positioning a child in the system when it is installed in aircraft, and adjusting the system to fit the child. In the case of each child restraint which is not intended for use in aircraft at certain adjustment positions, the following statement, with the manufacturer's restrictions inserted, shall be included in the instructions.

DO NOT USE THE—ADJUSTMENT POSITION(S) OF THIS CHILD RESTRAINT IN AIRCRAFT.



"A" represents a 2- to 3-inch thick polyurethane foam pad, 1.5–2.0 pounds per cubic foot density, over 0.020-inch-thick aluminum pan, and covered by 12- to 14-ounce marine canvas. The sheet aluminum pan is 20 inches wide and supported on each side by a rigid structure. The seat back is a rectangular frame covered with the aluminum sheet and weighing between 14 and 15 pounds, with a center of mass 13 to 16 inches above the seat pivot axis. The mass moment of inertia of the seat back about the seat pivot axis is between 195 and 220 ounce-inch-second². The seat back is free to fold forward about the pivot, but a stop prevents rearward motion. The passenger safety belt anchor points are spaced 21 to 22 inches apart and are located in line with the seat pivot axis.

Simulated Aircraft Passenger Seat

FIGURE 6

S8.2 Inversion test. When tested in accordance with S8.2.1 through S8.2.5 and adjusted in any position which the manufacturer has not, in accordance with S8.1, specifically warned against using in aircraft, each child restraint system manufactured for use in aircraft shall meet the requirements of S.8.2.1 through S8.2.6. The manufacturer may, at its option, use any seat which is a representative aircraft passenger seat within the meaning of S4.

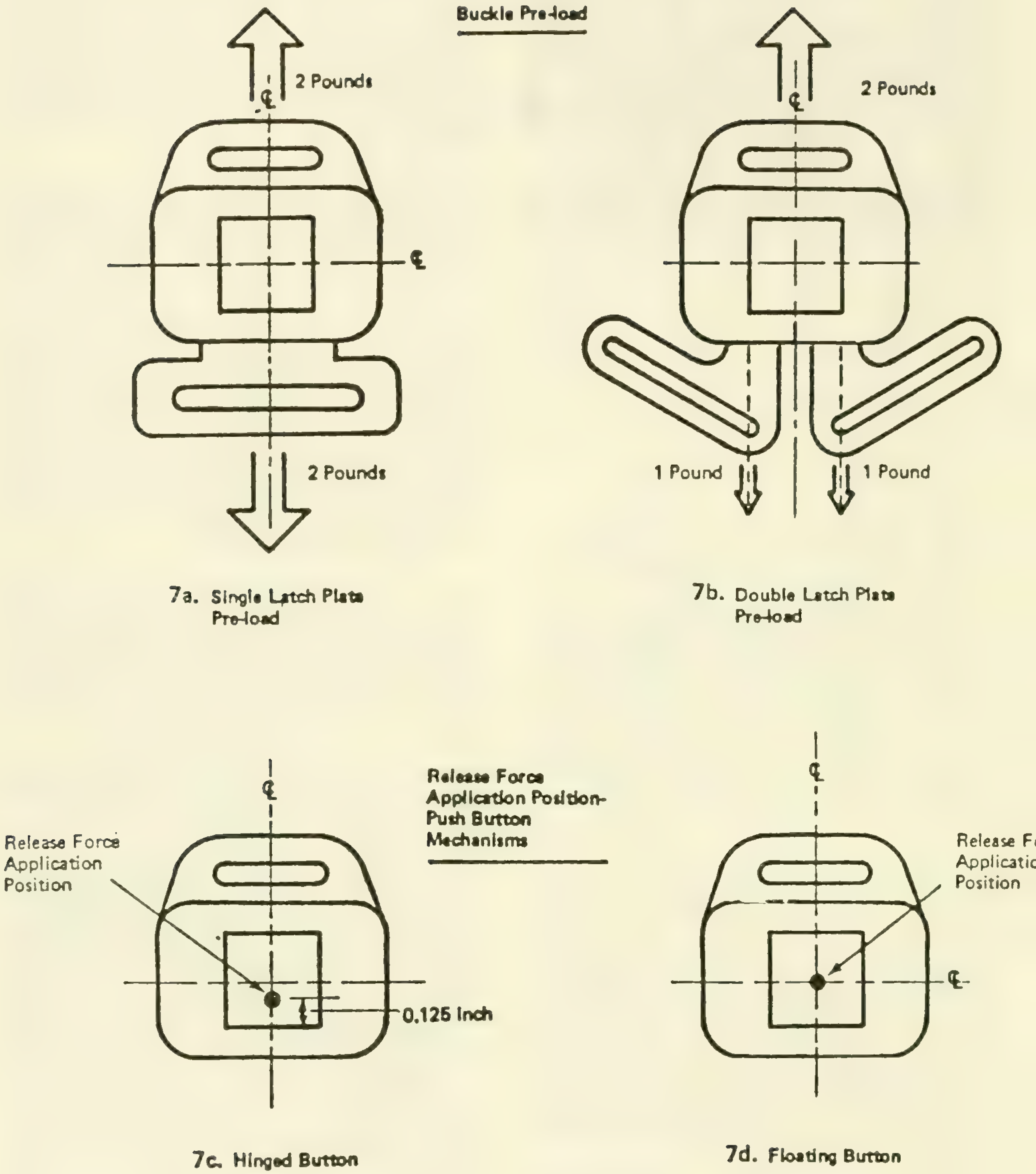
S8.2.1 A representative aircraft passenger seat shall be positioned and adjusted so that its horizontal and vertical orientation and its seat back angle are the same as shown in Figure 6.

S8.2.2 The child restraint system shall be attached to the representative aircraft passenger seat using, at the manufacturer's options, any Federal Aviation Administration approved aircraft safety belt, according to the restraint manufacturer's instructions for attaching the restraint to an aircraft seat. No supplementary anchorage belts or tether straps may be attached; however, Federal Aviation Administration approved safety belt extensions may be used.

S8.2.3 In accordance with S6.1.2.3.1 through S6.1.2.3.3, place in the child restraint any dummy specified in S7 for testing systems for use by children of the heights and weights for which the system is recommended in accordance with S5.5 and S8.1.

S8.2.4 If provided, shoulder and pelvic belts that directly restrain the dummy shall be adjusted in accordance with S6.1.2.4.

S8.2.5 The combination of representative aircraft passenger seat, child restraint, and test dummy shall be rotated forward around a horizontal axis which is contained in the median transverse vertical plane of the seating surface portion of the aircraft seat and is located one inch below the bottom of the seat frame, at a speed of 35 to 45 degrees per second, to an angle of 180 degrees. The rotation shall be stopped when it reaches that angle and the seat shall be held in this positon for three seconds. The child restraint shall not fall out of the aircaft safety belt, nor shall the test dummy fall out of the child restraint at any time during the rotation or the three second period. The specified rate of rotation shall be attained in not less than one-half second,



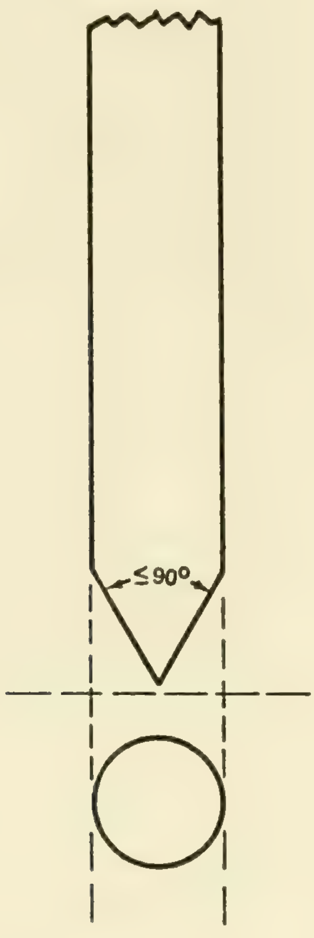
Pre-Impact Buckle Release Force Test Set-up

FIGURE 7

and not more than one second, and the rotating combination shall be brought to a stop in not less than one half second and not more than one second.

S8.2.6 Repeat the procedures set forth in S8.2.1 through S8.2.4. The combination of the representative aircraft passenger seat, child restraint, and test dummy shall be rotated sideways around a horizontal axis which is contained in the median longitudinal vertical plane of the seating surface portion of the aircraft seat and is located one inch below the bottom of the seat frame, at a speed of 35 to 45 degrees per second, to an angle of 180 degrees. The rotation shall be stopped when it reaches that angle and the seat shall be held in this position for three seconds. The child restraint shall not fall out of the aircraft safety belt, nor shall the test dummy fall out of the child restraint at any time during the rotation or the three second period. The specified rate of rotation shall be attained in not less than one half second and not more than one second, and the rotating combination shall be brought to a stop in not less than one half second and not more than one second.

44 F.R. 72131
December 13, 1979



Release Force Application Device—Push Button Release Buckles

FIGURE 8